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Contextualisation et conceptualisation de la planification collaborative des projets de transformation d'affaires

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Thèse présentée en vue de l'obtention du diplôme de *Philosophiae Doctor*

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Cette thèse intitulée :

Contextualisation et conceptualisation de la planification collaborative des projets de transformation d'affaires

présentée par **Sedki ALLAOUI**

en vue de l'obtention du diplôme de *Philosophiae Doctor*

a été dûment acceptée par le jury d'examen constitué de :

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DÉDICACE

À mes parents, pour avoir planté la graine de toujours apprendre

À mon épouse, pour être ma parfaite partenaire

À mes enfants, présents et futurs, pour vous inspirer à aller plus loin

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RÉSUMÉ

Les projets deviennent des plus en plus collaboratifs comme ils font intervenir plusieurs équipes pour livrer des produits et des systèmes complexes. La collaboration impose un changement aux pratiques de gestion de projets afin de mieux gérer les relations entre les parties prenantes et contribuer efficacement aux succès et performance des projets. Plus spécifiquement, la planification est identifiée dans la littérature comme une pratique centrale à la gestion de projets qui influence l'efficacité de la collaboration. Cela dit, la littérature sur la planification collaborative en gestion de projets est peu développée comparativement à d'autres domaines de recherche comme la gestion des chaines logistiques. De plus, la majorité des études sur la gestion collaborative des projets portent sur les projets d'ingénierie et construction. Comme le contexte influence la compréhension des pratiques et phénomènes observés, l'étude d'autres contextes de projets offre des opportunités pour développer les pratiques de gestion collaborative des projets, plus spécifiquement la planification collaborative.

Cette thèse vise à explorer la nature et les caractéristiques de la planification collaborative dans le contexte des projets de transformation d'affaires. Cette étude a été effectuée en partenariat avec une entreprise industrielle. La méthodologie de recherche adoptée est exploratoire et en deux phases. Une recherche-action participative a permis d'étudier et comparer des cadres de transformations d'affaires existants dans la littérature, et l'élaboration d'un cadre de gestion de transformation adapté au contexte du partenaire industriel. Ensuite, une approche par étude de cas multiples a permis l'analyse des processus actuels de planification des projets de transformation d'affaires. De plus, les dimensions et exigences de la planification collaborative dans ce contexte ont été identifiés. Ces résultats sont discutés à la lumière de la littérature et les spécificités du contexte organisationnel.

Cette thèse contribue au développement de la pratique de la planification collaborative en gestion de projets, et à la littérature sur la contextualisation des projets en étudiant les projets de transformation d'affaires et en proposant une adaptation à un contexte organisationnel spécifique. Les conclusions de cette recherche restent limitées aux cas étudiés et le contexte organisationnel choisi. Étendre le nombre de cas et d'organisations étudiés est une opportunité pour des recherches futures sur le sujet de la planification collaborative en gestion de projet.

ABSTRACT

Projects are becoming increasingly collaborative as they include multiple teams to deliver complex products and systems. Collaboration imposes changes to project management practices to enhance the coordination of relations between stakeholders and contribute efficiently to the success and performance of projects. Specifically, planning has been recognized as a central practice to project management which has an important influence on the efficiency of collaborative work during the project. Nevertheless, project management literature has few studies exploring the concept of collaborative planning comparatively with other research fields like supply chain management. In addition, the majority of research on collaborative project management was performed for engineering and construction projects. As contexts influence the understanding and application of concepts, the study of other project contexts offers opportunities to explore and develop collaborative project practices, more specifically collaborative planning.

The objective of this thesis is to explore the nature and characteristics of collaborative planning in the context of business transformation projects. This study was conducted in partnership with an industrial organization. The research methodology applied has two phases. First, a participative action research approach allowed for an understanding of the industrial partner's organizational context. It also led to the analysis and comparison of business transformation frameworks in the literature which supported the development and adaptation of a business transformation framework specific to the industrial partner's context. Second, a multiple case study approach led to the analysis of current planning processes in the business transformation cases selected. Then, the dimensions and requirements of collaborative planning were identified. These results are discussed in light of the existing literature and specificities of the context of study.

This thesis contributes to the development of collaborative planning practice in project management and to the literature on projects' contextualization by studying business transformation projects and proposing a framework adaptation to a specific organization. This research's conclusions are limited to the cases and organization selected. Extending the research approach to cover more cases and organizations represents an opportunity for future research efforts.

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CHAPITRE 1 INTRODUCTION

Le contexte économique actuel est caractérisé par la valorisation du savoir et une croissance sans précédent des changements technologiques. L'organisation du travail a par conséquent évolué pour s'adapter et la collaboration en est devenue une nature inhérente (Engeström, 2008), surtout pour les projets qui comptent de plus en plus des équipes multidisciplinaires et diverses parties prenantes internes et externes. Pour les projets, qui sont des organisations temporaires de travail, la collaboration permet la résolution de problèmes complexes par la mise en commun de ressources et expertises diverses (Emmitt, 2010).

La collaboration représente aussi des défis de gestion pour les projets. Le travail collaboratif requiert des efforts pour gérer les relations entre individus, équipes, et organisations collaborant sur le projet (Ollus, Jansson, Karvonen, Uoti et Riikonen, 2011). La présence de multiples parties prenantes rajoute aussi de l'incertitude aux projets qui croit selon la nature des relations et dépendances entre les collaborateurs. Des exemples de difficultés de gérer la collaboration seraient : la gestion de conflit entre les individus, la coordination de l'exécution simultanée de plusieurs équipes, et l'alignement des objectifs et des décisions entre plusieurs organisations (Huxham et Vangen, 2005). La collaboration rajoute donc à la complexité et l'incertitude des projets. Deux défis pour lesquels la planification est proposée comme une solution (Christensen, 1985).

En gestion de projets, la planification peut être définie comme un processus de prise de décision qui prépare l'exécution du projet. Elle peut être aussi définie comme une phase dans le cycle de vie du projet qui précède la phase d'exécution (Serrador, 2015). Au-delà de la variation dans les définitions de la planification, il y a un consensus dans la littérature sur sa valeur et sa contribution à la réussite des projets (Dov Dvir, Raz et Shenhar, 2003; Serrador, 2013). En fait, la planification est considérée une pratique centrale en gestion de projets qui augmente les chances de succès des projets. Elle permet de réduire l'incertitude et les risques associés au projet en assurant une préparation adéquate des activités et des ressources pour atteindre les objectifs (Kerzner, 2013). Historiquement, la planification était au cœur de l'évolution du domaine de gestion de projet. Une évolution qui était centrée sur les techniques de planification comme celles de l'ordonnancement (Pellerin et Perrier, 2018). De plus, plusieurs modèles de planification ont été proposés pour s'adapter à la nature spécifique des projets, comme les différences entre la construction et le

développement logiciel (Serrador, 2015). Ceci dit, les études de la planification en gestion de projets selon une approche par processus sont comparativement peu fréquentes. Peu de recherches investiguent le déroulement des activités de la planification des projets, les rôles dans ces processus et les outils technologiques qui les supportent.

La planification et la collaboration sont deux concepts dépendants du contexte du projet. L'approche de planification et la dynamique du travail collaboratif dans le projet varient selon plusieurs facteurs contextuels, surtout la catégorie du projet et les organisations impliquées (Klimkeit, 2013). La littérature en gestion de projets traite majoritairement des contextes de la construction et des technologies de l'information (Serrador, 2015). L'étude d'autres contextes offre des opportunités de compréhension plus fine des théories en gestion de projets et le développement de pratiques plus adéquates aux réalités des différents projets (Niknazar et Bourgault, 2017). Dans cette recherche, les projets de transformation d'affaires ont été choisis comme contexte d'étude. En fait, les pratiques actuelles de gestion de projets ne sont pas toutes adaptées au contexte de la transformation d'affaires (Cha, Newman et Winch, 2018)

La transformation d'affaires peut être définie comme l'ensemble des approches qui introduisent des changements radicaux dans les organisations pour livrer des bénéfices d'affaires importants, le tout relativement à la réalité des organisations (Purchase, Parry, Valerdi, Nightingale et Mills, 2011). La transformation d'affaires utilise des approches holistiques qui prennent en compte toutes les dimensions d'une organisation; la stratégie, les processus, les technologies, et les gens. La transformation d'affaires est caractérisée par un taux d'échec important qui varie entre 40 et 70 pour cent (McKinsey, 2008b; Nohria et Beer, 2000). Les initiatives de transformation d'affaires ont un impact important sur la performance des organisations, et même leurs survies dans leurs marchés (Faeste, Hemerling, Keenan et Reeves, 2014). La gestion de projets et la gestion des programmes sont considérées des facteurs de succès pour les initiatives de transformation d'affaires (Uhl et Gollenia, 2013). De telles initiatives offrent un contexte riche en opportunités de développement des pratiques en gestion de projets, et de la planification en particulier.

Spécifiquement, établir et tirer parti des liens entre la planification et la collaboration dans le contexte des transformation d'affaires peut être une piste d'amélioration des chances de succès de cette catégorie de projets. En gestion de projets, les impacts de la collaboration sur les processus de planification ont été peu discutés (Shelbourn, Bouchlaghem, Anumba et Carrillo, 2005). Dans

d’autres domaines de recherche, la planification collaborative a été proposée comme une approche intégrant la collaboration dans les processus de planification. Par exemple, dans le domaine de la gestion des chaines logistiques, la planification collaborative est définie comme une approche de planification qui met en commun des entités diverses de planification dans la chaine logistique pour produire un plan (Stadtler, 2009). Un meilleur engagement des parties prenantes dans la planification puis l’exécution du plan peut être mentionné parmi les bénéfices d’une telle approche qui reste encore peu développée en gestion de projet.

Ainsi, l’intérêt de cette recherche comprend quatre thèmes variés et inter-reliés; la collaboration en gestion de projets, la planification des projets, la contextualisation des projets, et les liens entre la planification et la collaboration sous la forme de la planification collaborative en gestion de projets. Cette thèse a donc pour objectif d’explorer les liens entre la planification et la collaboration dans le contexte des projets de transformation d’affaires. L’approche de recherche adoptée est exploratoire et investigue trois aspects :

1) Les caractéristiques des projets de transformation d’affaires comme le contexte d’étude;
2) L’état des lieux des processus de planification des projets; et
3) La nature des liens entre collaboration et planification pour cette catégorie de projets.

Cette thèse commencera par une revue de la littérature sur la gestion de projets collaboratifs, la planification collaborative, et la contextualisation des projets. La revue vise à faire un état des lieux des recherches sur chaque thème et les lier pour identifier les écarts justifiant la pertinence de ce projet doctoral. Le Chapitre 3 débutera par la clarification des objectifs spécifiques de la recherche, puis détaillera la méthodologie de recherche utilisée. Le Chapitre 4 présentera sommairement les résultats de recherche qui seront exposés en détail sous forme d’articles scientifiques dans les chapitres 5 à 8. Le Chapitre 9 portera sur une discussion de certains éléments communs entre les quatre articles ainsi que des contributions scientifiques de cette recherche. Finalement, cette thèse conclura par une révision des défis et limitations de recherche pour introduire des avenues de recherches futures.

CHAPITRE 2 REVUE DE LA LITTÉRATURE

Pour positionner le sujet d'intérêt pour cette thèse, la planification collaborative en gestion de projets, ce chapitre débutera par une revue de la littérature sur la collaboration en gestion de projets; sa nature et les pratiques de gestion collaboratives des projets. La planification sera par la suite ciblée pour parcourir les études qui ont porté sur les liens entre la collaboration et la planification en gestion de projets et aussi dans d'autres champs de recherche. Les deux concepts de collaboration et de planification sont caractérisés et influencés par le contexte d'étude et la catégorie de projets considérée. Ce chapitre conclura donc par clarifier la contextualisation des projets et les travaux clés qui en traitent dans la littérature.

2.1 La collaboration en gestion de projets

Cette section explore les études dans le domaine de la gestion de projets collaboratifs. Elle commencera par discuter la définition de la collaboration dans le contexte des projets et son influence sur l'évolution de la gestion de projets. Par la suite, les directions de recherche dans la littérature seront discutées pour indiquer un accent sur l'étude des relations interorganisationnelles et le développement des technologies de support à la collaboration. Une attention particulière sera portée sur les activités et pratiques de planification en collaboration qui indique un manque d'approches systémiques pour étudier le sujet, et une prédominance du contexte des projets en ingénierie et construction. Cette section conclura que la planification collaborative en gestion de projets reste un concept à explorer.

2.1.1 La nature collaborative des projets

Le dictionnaire Larousse définit le verbe collaborer comme : « *participer avec un ou plusieurs autres à une œuvre commune* » (Larousse, s.d.). Une interprétation possible serait de considérer chaque effort qui nécessite le travail de plus qu'un individu comme collaboratif. Une analogie similaire indiquerait donc que tout projet inclut la collaboration par défaut, et que qualifier un projet par collaboratif serait redondant. Il est donc important de situer la collaboration par rapport à la gestion de projets. En fait, la collaboration se manifeste à plusieurs niveaux : entre des individus, entre des équipes, entre des organisations. En gestion de projets, différents niveaux de collaboration requièrent des efforts de gestion et surtout de coordination différents (Nunamaker, Romano et

Briggs, 2003). De plus, la collaboration est interprétée différemment selon la perspective des participants et elle varie selon son contexte d'application et d'étude (Henneman, Lee et Cohen, 1995; Wood et Gray, 1991). Ceci dit, les différentes définitions de la collaboration dans la littérature partagent certains éléments dont :

1) La participation de plus qu'une entité organisationnelle,
2) La mise en commun de ressources (humaines, financières, matérielles, etc.), et
3) L'action vers une vision ou un objectif commun.

Pour cette étude, l'intérêt sera pour les projets où plus que deux entités organisationnelles mettent en commun leurs ressources et expertises pour la réalisation d'un objectif commun (Klaus, 2009). Ces entités peuvent être dans la même organisation (intraorganisationnelles) ou à travers plusieurs organisations (interorganisationnelles). Les projets, qui peuvent être qualifiés de collaboratifs, se distinguent par l'intervention de multiples parties prenantes avec des expertises et des ressources complémentaires (Emmitt, 2010). Ce sont aussi des projets dont la complexité des produits et systèmes à livrer est augmentée par la complexité des relations et interactions à gérer lors de leurs livraisons (Davies et Brady, 2000), surtout quand il s'agit d'équipes dispersées (Bourgault et Daoudi, 2014).

La collaboration est coûteuse et difficile à gérer pour les organisations (Huxham et Vangen, 2005). Engeström (2008) suggère que la collaboration est une forme d'organisation du travail qui correspond à une transformation des exigences sociales et économiques. Elle est aussi une transformation des cultures et surtout des styles et pratiques de gestion des organisations (Blackler, Crump et McDonald, 1999). Le caractère temporaire des projets accentue les défis de gestion de la collaboration et intensifie l'évolution des pratiques de gestion de projets pour s'adapter aux exigences du travail collaboratif (Niebecker, Eager et Kubitza, 2008).

2.1.2 La gestion de projets collaboratifs

Le changement dans la nature du travail dans les projets et la croissance des besoins en collaboration ont changé les pratiques de gestion de projets d'un accent sur les activités à un accent sur les produits et les connaissances (Klaus, 2009). Evaristo et van Fenema (1999) utilisent une typologie des approches de gestion de projets selon la dispersion des équipes. Ils argumentent que l'évolution des projets d'un modèle traditionnel où les équipes sont colocalisées vers des modèles

plus dispersés impose des développements aux pratiques et techniques de gestion de projets pour s'y adapter. De plus, la collaboration requiert un effort de communication et de coordination plus intense (Helbrough, 1995). Nunamaker et al. (2003) suggèrent que le mode de collaboration dépend de l'intensité de coordination et de la structure requise des processus. Ils proposent trois niveaux de collaboration : travail collectif, travail coordonné, et travail concerté. Au niveau concerté, la gestion de projets requiert une attention particulière à la coordination. Le tout renforce le besoin de faire évoluer et développer la gestion de projets et ses pratiques pour relever les défis des projets collaboratifs et leurs complexités (Moody et Dodgson, 2006).

La littérature sur la gestion de projets collaboratifs s'est développée suivant deux directions (Ollus et al., 2011) :

1) *La gestion de la collaboration* : des études et pratiques qui permettent une gestion efficace de la collaboration lors de la livraison des projets. La collaboration est étudiée selon plusieurs perspectives comme la gestion des relations interorganisationnelles pour optimiser le travail collaboratif, ou l'utilisation des technologies de l'information pour supporter le partage des informations et l'exécution des tâches collaboratives. Par exemple, dans les projets de construction l'utilisation de plateforme de partage des données facilite le travail collaboratif pendant l'exécution du projet.
2) *La gestion en collaboration* : vise à intégrer la collaboration dans les approches de planification, d'exécution et de contrôle des projets. La collaboration est étudiée comme un attribut des processus de gestion de projets comme le design des produits et le contrôle de la performance du projet. Par exemples, intégrer des pratiques et techniques collaboratives améliore la qualité des activités de design de produits.

Les paragraphes suivants discutent des tendances dans chaque direction de recherche en fournissant des exemples d'études dans la littérature.

2.1.3 La gestion de la collaboration

Les études dans cette catégorie s'intéressent à des questions de recherche du type : « comment améliorer la gestion de la collaboration dans les projets ? » Elles proposent donc des cadres différents de gestion de projets collaboratifs qui mettent l'accent sur la gestion des relations

interorganisationnelles et le développement de technologies et outils de support (Shelbourn et al., 2005).

La recherche en gestion de projets collaboratifs a été centrée sur des contextes où les relations interorganisationnelles sont cruciales à la réussite : comme la construction (Matinheikki, Artto, Peltokorpi et Rajala, 2016), le développement de nouveau produit (Zhang et al., 2009), et la recherche universitaire (vom Brocke et Lippe, 2015). Structurer et gouverner ces relations améliore l'efficacité de la collaboration lors de la livraison des projets (DeFillippi et Sydow, 2016; Vangen, Hayes et Cornforth, 2015). La gouvernance des relations interorganisationnelles vise à établir une balance entre la flexibilité de s'adapter aux besoins de chaque projet et la standardisation pour une meilleure efficacité d'exécution pour les organisations. Chakkol, Selviaridis et Finne (2018) trouvent que l'utilisation des standards de collaboration comme ISO 44001[1] améliore la gouvernance des relations entre les collaborateurs aux projets. Ils suggèrent que l'adoption de tels standards soit un prérequis pour participer à des projets collaboratifs. La tendance est en fait vers le développement des réseaux organisationnels aux préalables des projets (Bengtson, Havila et Åberg, 2018; T. Braun, 2018; Chakkol et al., 2018). Ceci permet aux organisations de développer des relations et préparer les aspects intangibles de la collaboration qui nécessitent du temps, comme la confiance entre les partenaires. Le développement de tels réseaux accélère la prise de décision critique dans les projets collaboratifs (Wen, Qiang et Gloor, 2018). D'autres approches sont aussi proposées, comme l'alignement entre les partenaires aux projets en utilisant des mesures de performances communes et connectées (Niebecker et al., 2008) ou l'utilisation de cadre de gestion de la qualité de la collaboration pendant le projet (Dietrich, Eskerod, Dalcher et Sandhawalia, 2010).

Il reste que lors de l'exécution des processus et activités des projets, la gestion de la collaboration est encore nécessaire surtout en termes de coordination entre les parties prenantes. Une portion assez importante des recherches sur la gestion de projets collaboratifs s'est donc portée sur le développement de cadre et outils technologiques pour supporter la collaboration. L'avenue technologique a été parmi les premières pistes de solutions explorées pour aider à mieux gérer la

[1] ISO 44001:2017 - Systèmes de management collaboratif d'une relation d'affaires -- Exigences et cadre de travail

collaboration dans les projets et améliorer la coordination et la communication (Helbrough, 1995; Kurbel, 1994). Une partie de ces technologies, appelées Groupware, facilite l'interaction entre les individus et le partage des informations sur les activités (Boughzala, 2007; Harley, 2011; Schmidt et Bannon, 1992). Pour des projets avec des produits et systèmes complexes, les technologies de modélisation, comme le BIM (Building Information Modeling) sont aussi utilisées comme des plateformes de collaboration (Dossick et Neff, 2011; Huahui, Xueyuan et P., 2019; Kerosuo, Mäki et Korpela, 2013; I.-C. Wu et Hsieh, 2012). Le point de départ est la modélisation du système ou du produit à livrer par le projet en utilisant une maquette numérique. Les informations sont par la suite partagées et échangées sur les différentes facettes du système. Xu, Ming, Song, He et Li (2014) proposent d'améliorer ces outils en ajoutant un aspect plus systémique aux outils technologiques en tenant compte de : la décomposition du produit (PBS – Product Breakdown Structure), la décomposition des activités (WBS – Work Breakdown Structure), et de la décomposition organisationnelle (OBS – Organisational Breakdown Structure).

La littérature a principalement traité des relations interorganisationnelles et le développement des technologies de support à la collaboration (Xu et al., 2014). L'utilisation des technologies d'information n'est pas suffisante pour une collaboration efficace dans les projets, il est nécessaire de la lier aux aspects organisationnels et humains de la collaboration (Nidiffer et Dolan, 2005). Shelbourn, Bouchlaghem, Anumba et Carrillo (2007) indiquent qu'une collaboration efficace repose sur les aspects humains (40 %), les aspects technologiques (26 %), et les processus et procédures de travail (34 %). Les études qui traitent des processus et procédures en lien avec la collaboration sont plus dans la catégorie de « gérer les projets en collaboration », car leur accent est sur comment les activités de la gestion de projets s'exécutent de manière collaborative.

2.1.4 La gestion en collaboration

La question clé pour cette catégorie d'études est : « comment gérer de manière collaborative les projets ? » Quoique les activités de gestion de projets s'étendent tout au long du projet selon plusieurs groupes de processus (Project Management Institute, 2017), les recherches en gestion de projets collaboratifs se sont concentrées sur les premières phases du cycle de vie du projet, surtout les activités en lien avec la planification.

Les premières phases du cycle de vie du projet ont une influence directe sur le déroulement et la performance de l'exécution du projet. En lien avec la collaboration, un des facteurs importants

pendant ces phases est l'implication et la participation des parties prenantes (Kolltveit et Grønhaug, 2004). En effet, le manque d'implication des parties prenantes tôt dans la vie du projet, et surtout pendant sa planification, diminue la qualité des livrables du projet (Heravi, Coffey et Trigunarsyah, 2015). Les processus de planification offrent les situations optimales pour inclure des parties prenantes afin qu'elles puissent influencer les décisions sur la livraison des projets. C'est pourquoi plusieurs études se sont attardées sur la collaboration pendant ces processus et dans des activités spécifiques.

Les études les plus fréquentes portent sur la collaboration pendant les activités de design du projet. Plusieurs méthodes proposées utilisent les technologies de l'information. Par exemple, Anumba, Ugwu, Newnham et Thorpe (2002) décrivent le potentiel d'utiliser des systèmes agents comme des outils supportant le processus de design. Un agent est une entité informatique qui traite un ensemble de données suivant une séquence d'activités tout en interagissant avec d'autres agents ou des interfaces utilisateurs. Les systèmes de modélisation des produits comme le BIM ont été aussi suggérés comme des outils d'aide à conception en facilitant la collaboration lors du design (Liu, van Nederveen et Hertogh, 2017; Oh, Lee, Hong et Jeong, 2015). D'autres études utilisent la colocalisation des équipes comme la base d'une approche de design en collaboration. Mark (2002) décrit l'approche de collaboration extrême (XC – Extreme Collaboration) développée à la NASA (National Aerospace and Spatial Agency) qui permet essentiellement de grouper les différentes disciplines dans un seul espace physique et utilise des outils de partage d'information. Garcia, Kunz, Ekstrom et Kiviniemi (2004) ajoutent deux dimensions à l'aspect de colocalisation physique en ajoutant la modélisation du produit et la modélisation de l'organisation et des processus. Ce modèle appelé Tripod a été testé dans des projets d'ingénierie et construction.

Comme pour les activités et décisions de design, celles de la planification des projets requièrent aussi du support de communication et de coordination dans un contexte collaboratif (Kurbel, 1994). En représentant le projet comme des agents dispersés et dynamiques de planification, Knotts, Dror et Hartman (1998) proposent un processus de planification qui sépare et décompose les activités et les équipes en premier, puis les rassemble pour simuler en groupe les scénarios de planification en utilisant une modélisation des activités selon un formalisme inspiré des circuits électriques. Les auteurs discutent principalement d'un ordonnancement dynamique des activités du projet en incitant la collaboration entre les différentes équipes impliquées. D'autres recherches ont aussi étudiés la collaboration lors de l'ordonnancement des activités en développant des modèles

spécifiques d'ordonnancement qui intègrent la collaboration comme des contraintes (Baudin, Bonnal, Nicquevert et Ruiz, 2013), ou en utilisant des techniques de simulation comme les systèmes agents (Knotts et Dror, 2003; S. Wu et Kotak, 2003; Zhang et al., 2009).

Cependant, il n'est pas toujours possible de regrouper toutes les équipes participantes dans un projet, surtout pour des équipes dispersées. De plus, l'ordonnancement est une partie des décisions de planification des projets complexes qui se fait à plusieurs niveaux entre les organisations collaboratrices (Hans, Herroelen, Leus et Wullink, 2007). Au niveau de planification tactique, Ren, Anumba, Hassan, Augenbroe et Mangini (2006) proposent une approche utilisant une plateforme informatique appelée *e-engineering hub* qui offre un espace de collaboration pour la prise de décision en planification. Les auteurs utilisent les processus et techniques de planification offerts dans les référentiels comme le PMBOK[2] (Project Management Institute, 2017) et les intègrent dans une plateforme de partage d'information sur le web. L'avantage principal noté par cette recherche est une transparence et visibilité améliorée sur les décisions de planification qui induit des liens de confiance plus forts entre les organisations participantes au projet. D'autres plateformes technologiques ont aussi été promues pour supporter une planification collaborative des projets. En construction, des outils basés sur le BIM sont proposés pour accompagner la prise de décision lors de la planification (Tallgren, 2018; Tallgren, Roupé, Johansson et Andersson, 2015).

Shelbourn, Bouchlaghem, Anumba et Carrillo (2006) indiquent que la littérature sur la gestion collaborative des projets s'est concentrée sur la livraison de modèles et outils technologiques. Le même groupe de chercheurs a démarré une initiative de recherche pour évaluer et explorer la planification en collaboration des projets dans l'industrie de la construction : le PIECC (Planning and Implementation of Effective Collaboration within Construction) (Shelbourn, Bouchlaghem, Anumba et Carrillo, 2006b). Son objectif était de développer un modèle de prise de décision stratégique pour guider les organisations à planifier les pratiques collaboratives et les implanter dans l'industrie de la construction. La méthodologie de recherche est basée sur des données collectées suite à des entrevues semi-structurées et des questionnaires. Ces données visaient à établir les besoins des organisations, des gestionnaires de projets et des usagers. La collecte de

[2] Project Management Body Of Knowledge: un référentiel publié par le PMI (Project Management Institute) sur le corpus des connaissances en gestion des projets.

données est consolidée par une revue de la littérature sur la collaboration dans la construction et dans d'autres industries. L'analyse suggère qu'une collaboration efficace devrait trouver l'équilibre entre trois domaines stratégiques : les affaires, les gens et les technologies (Shelbourn et al., 2007). Le travail collaboratif se traduit généralement par des méthodologies de travail différentes. Par conséquent, un travail collaboratif efficace se réalise par le biais d'une innovation du design et des conceptions de la collaboration qui dépassent les outils informatiques et inclut des stratégies pour approcher l'organisation (processus d'affaires, vision et objectifs) et les ressources humaines (culture, engagement, etc.).

Le PIECC est une des rares recherches qui a adressé la mise en place d'une collaboration efficace en lien avec les processus de la planification d'une manière systématique incluant autant les aspects procéduraux, organisationnels et technologiques. D'autres études existent qui parlent des liens entre la planification et la collaboration, mais elles restent limitées à un aspect spécifique. Par exemple, Thomas, Jacques, Adams et Kihneman-Wooten (2008) traitent de l'intégration des efforts de bâtir les équipes aux processus de planification. Loring (2007) discute de la participation du public à travers des groupes d'influence dans la planification des projets d'infrastructure d'énergie éolienne. Boyce, Dainty et Thorpe (2012) réitèrent la valeur d'une planification en collaboration des projets et proposent une méthodologie de planification en collaboration qui utilise des outils de documentation et d'amélioration des processus.

Les projets collaboratifs requièrent la participation de plusieurs parties prenantes à un objectif commun par le partage de ressources et compétences variées. La gestion collaborative des projets offre des pratiques qui visent autant une meilleure gestion de la nature collaborative des projets et une gestion en collaboration des projets. Une grande partie de la recherche a été centrée sur la gestion des relations interorganisationnelles. Les défis interorganisationnels de la collaboration sont accentués par la nature temporaire des projets comme organisation de travail. Aussi, plusieurs études proposent et développent des outils technologiques pour supporter le travail collaboratif pendant les projets. Cependant, les accents sur la dimension organisationnelle ou la dimension technologique seulement se sont avérés moins efficaces qu'une perspective plus inclusive de la collaboration qui incorpore aussi l'aspect processus. La planification en tant que phase qui arrive tôt dans le cycle de vie des projets regroupe des processus où l'implication des parties prenantes a démontré une influence majeure sur le succès et la performance des projets. La littérature a proposé

des approches de planification qui améliorent la composante collaborative pour certaines activités comme le design.

Toutefois, la gestion en collaboration des projets reste moins développée, plus spécifiquement comment planifier un projet en collaboration. Dans d'autres domaines de recherche comme en gestion des chaines logistiques ou en gestion manufacturière, la notion de planification collaborative a été explorée, développée, et a prouvé sa valeur. Une telle pratique permet aux différentes entités de planification de participer à la définition du plan et pour assurer un engagement plus élevé dans son exécution. En outre, les projets d'ingénierie et de construction ont la part de lion dans les recherches et études de cas sur la gestion collaborative des projets. D'autres catégories et contextes ont marqué leur présence comme la recherche et développement. Le contexte d'étude influence la nature et les pratiques de gestion de projets (D Dvir, Lipovetsky, Shenhar et Tishler, 1998) surtout quand il s'agit de concepts très liés aux facteurs humains et organisationnels comme la collaboration et la planification. L'exploration des pratiques collaboratives de gestion de projets dans d'autres contextes que l'industrie de l'ingénierie et la construction représente une opportunité de recherche.

La planification collaborative et la contextualisation des projets seront discutées dans les deux sections suivantes.

2.2 La planification collaborative

Comme mentionné dans la section précédente, la planification joue un rôle d'influence important sur l'efficacité du travail collaboratif et son impact sur le succès des projets. Cette section débutera par introduire la planification des projets, puis discutera de la planification collaborative comme concept dans domaines de recherche pour confirmer à sa fin l'opportunité d'explorer une telle pratique pour la gestion de projets.

2.2.1 La planification des projets

La planification est une pratique de gestion qui permet de réduire les risques et les incertitudes (Christensen, 1985) et dont les définitions et méthodologies varient selon le domaine d'application (Pinedo, 2009). En gestion de projets, la planification peut être définie à la fois comme un processus

et aussi comme une phase du cycle de vie du projet. Selon le PMBOK[3], la planification est un ensemble de processus qui permet d'établir la portée du projet, de raffiner les objectifs, et de définir la séquence des actions requises pour les atteindre (Project Management Institute, 2017). Selon PRINCE2[4], la planification est l'ensemble des processus qui permettent la création et le maintien d'un plan de projet; un document qui décrit les détails nécessaires pour l'atteinte d'une cible spécifique du projet (Office Of Government Commerce, 2009). Serrador (2015) utilise une définition plus inclusive de la planification comme la phase qui précède l'exécution dans le projet. Meredith et Mantel (2009) indiquent que la planification vise à définir la direction et les objectifs pour l'exécution des actions du projet. De plus, la planification des projets peut être définie comme un processus de prise de décision (Baldwin et Bordoli, 2014) qui permet de répondre aux questions suivantes (Melton, 2008) :

- *Pourquoi ?* Examiner les motivations et les bénéfices d'affaires que le projet doit satisfaire;
- *Quoi ?* Définir les objectifs du projet et les livrables attendus;
- *Quels sont les scénarios ?* Découvrir les scénarios possibles pour atteindre les objectifs;
- *Comment ?* Identifier l'approche et les activités détaillées pour atteindre les objectifs;
- *Qui ?* Identifier les ressources requises pour chaque activité;
- *Quand ?* Déterminer la séquence des activités et leurs durées; et
- *Combien ?* Estimer et budgéter les coûts et la quantité des ressources requises.

Pour aider à répondre à ces questions, des techniques de planification ont été développées. La majorité de la recherche portant sur ces techniques s'intéresse à l'ordonnancement (Pellerin et Perrier, 2018). Ceci peut s'expliquer en partie par le cadre historique du développement du domaine. La gestion de projets comme un champ de recherche est apparue dans les années après-guerre (1950 – 1960) avec l'émergence des techniques d'ordonnancement tel que CPM (Critical

[3] Project Management Body Of Knowledge: un référentiel publié par le PMI (Project Management Institute) sur le corpus des connaissances en gestion des projets.

[4] PRoject IN Controlled Environment : une méthode en gestion de projets qui a été développée comme un standard pour le gouvernement britannique. C'est maintenant reconnu comme un des référentiels en gestion de projets.

Path Method) et PERT (Program Evaluation and Review Technique). Elles sont inspirées du domaine de la gestion manufacturière (Baldwin et Bordoli, 2014). Dans la littérature, les termes de planification (*planning*) et ordonnancement (*scheduling*) sont souvent utilisés de manière interchangeable. Cela peut induire une mauvaise représentation de la planification des projets et la réduire à l'organisation temporelle des activités seulement (Melton, 2007). L'ordonnancement est principalement lié à la composante temporelle de la planification du projet. Il vise à déterminer la meilleure organisation des activités et quand elles devraient être commencé pour optimiser l'exécution du projet (International Project Management Association, 2015). Les études sur les techniques d'ordonnancement sont abondantes et proposent des modèles qui visent à optimiser la durée et le coût total du projet (Pellerin et Perrier, 2018).

La planification des projets est un processus itératif qui s'étend tout au long du cycle de vie du projet (Kerzner, 2013). Le processus lie les sous-processus de planification à ceux du contrôle et suivi (voir la Figure 2-1).

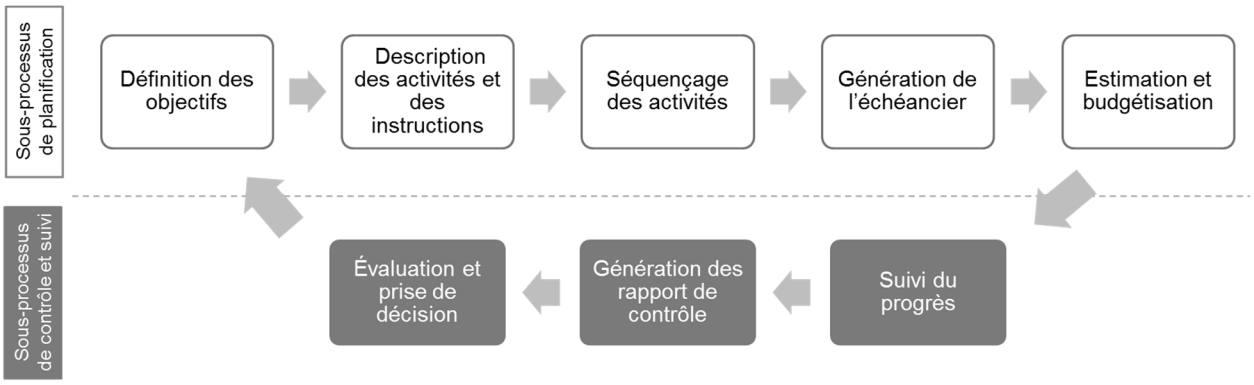

Figure 2-1. Les processus de planification et contrôle des projets (adapté de Kerzner 2013)

Indépendamment de la variété des définitions, l'attention accordée à la planification dans la littérature est une indication de son importance et son rôle central en gestion de projets. Dans les référentiels de gestion de projets, la planification a la majorité du contenu. Dans le PMBOK les processus de planification représentent 48 pour cent des processus recommandés pour gérer un projet (Project Management Institute, 2017). Il y a un consensus dans la littérature sur la contribution de la planification à augmenter les chances de succès des projets (Dov Dvir, 2005; Dov Dvir, Raz, et al., 2003). Dans une revue de la littérature sur les liens entre les efforts de planification et le succès des projets, Serrador (2013) conclut que la planification est associée au

succès des projets. Les bénéfices de la planification sont multiples. Selon Kerzner (2013), il y a quatre motivations pour la planification des projets :

1) Réduire l'incertitude;
2) Améliorer l'efficacité de l'exécution du projet;
3) Obtenir une meilleure compréhension des objectifs; et
4) Établir une base pour le contrôle et l'évaluation du travail.

En résumé, la littérature en gestion de projets offre des définitions variées de la planification qui partagent deux dimensions principales : l'aspect processus et la prise de décision. Il y a aussi un consensus sur l'importance de la planification pour une exécution efficace du projet et pour améliorer les chances de réussite. L'évolution de la recherche sur la planification a été centrée sur ses techniques, principalement celles de l'ordonnancement.

2.2.2 La planification collaborative dans d'autres domaines

Dans la littérature sur la gestion de projets collaboratifs, le terme planification collaborative a été utilisé pour indiquer des concepts différents. Dans certains cas, la planification collaborative indique un modèle d'ordonnancement des activités qui tient compte de la collaboration sous forme de contraintes (Baudin et al., 2013). Dans d'autres cas, la planification collaborative décrit des cadres de gestion et d'exécution des projets collaboratifs (Shelbourn et al., 2006a). Outre cela, dans d'autres domaines de recherche, comme la gestion des chaines logistiques, la planification collaborative a été définie et développée différemment.

Dans les recherches sur les chaines logistiques, la planification collaborative est définie comme un processus conjoint de prise de décision entre deux ou plusieurs partenaires afin d'aligner leurs plans individuels, coordonner leurs efforts et optimiser les résultats de la chaine logistique (Stadtler, 2009). Chaque membre de la chaine logistique a ses propres processus de planification et de prise de décision (voir la Figure 2-2). Kilger et al. (2008) qualifient ces processus locaux de planification de domaines locaux de planification « Local Planning Domains ». Chaque membre de la chaine logistique a son domaine local de planification, et l'objectif de la planification collaborative est d'assurer un domaine commun de planification entre les partenaires avec une solution globale la plus optimale possible au niveau de la chaine logistique.

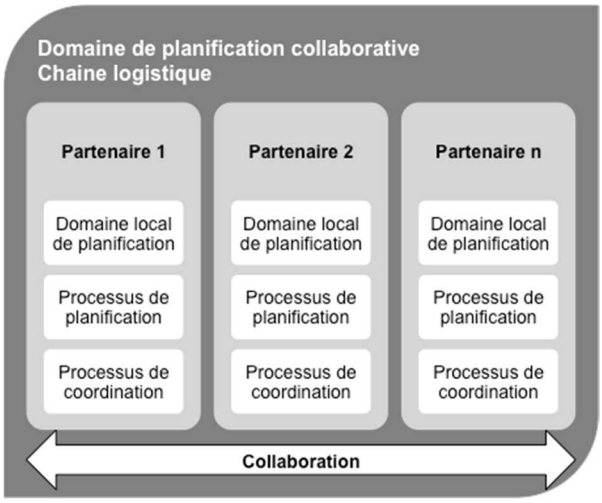

Figure 2-2. Domaines de planification collaborative

Les approches de planification collaborative dans une chaine logistique sont influencées par plusieurs facteurs (Hollmann, Scavarda et Thomé, 2015). Les plus importants sont :

1) La structure du réseau logistique et son impact sur le modèle de prise de décision;
2) La nature des informations échangées et leurs dynamiques d'échanges; et
3) Les approches de modélisation et de résolution des problèmes de planification locaux et collaboratifs.

La structure du réseau logistique influence principalement les décisions de planification stratégique comme la mise en place de partenariat (Azevedo, Toscano et Sousa, 2005). La nature et les mécanismes d'échanges de l'information définissent les modèles de partage qui spécifient par exemple les types, les formalismes, et les fréquences requises du partage des données (Ito et Rizal Salleh, 2000). Et les approches de modélisation servent d'intermédiaires pour optimiser le processus collaboratif et balancer les éléments locaux et communs de planification (Kilger et al., 2008).

Une des différences entre les chaines logistiques et les projets est l'aspect temporaire. Les chaines logistiques comptent plus des relations et des partenariats qui s'étendent sur des années et pour lesquels les organisations peuvent prendre du temps à bâtir. La répétabilité des processus de planification collaborative a plus d'effet économique dans le contexte des chaines logistiques que pour les projets où l'aspect temporaire restreint la période de retour sur investissement. Ceci dit,

d'autres domaines ont aussi cet aspect temporaire et utilisent des notions équivalentes de planification collaborative; comme dans le domaine militaire (McKerney, 2000), ou en urbanisme (Healey, 2003).

Dans tous ces domaines qui appliquent la planification collaborative, un des points communs est l'utilisation d'approches et de cadre qui incluent toutes les dimensions pertinentes au domaine. Par exemple, les processus manufacturiers sont importants en chaine logistique et sont intégrés dans la planification collaborative (de Kok et al., 2005). Dans les opérations militaires, les réseaux locaux des régions de conflits sont primordiaux et sont inclus dans la planification dite conjointe (Mccauley, 2011). L'équivalent de cet effort n'a pas encore était fait pour les projets collaboratifs. En partie à cause de l'importance du contexte, l'identification et l'intégration des dimensions à la planification collaborative seraient dépendantes du contexte des projets étudiés.

2.3 La contextualisation des projets

La revue de la littérature sur les projets collaboratifs et la planification collaborative indique que le contexte des projets étudiés a une influence sur le développement des pratiques de gestion. Cette section discutera donc de la contextualisation des projets et les sujets qui s'y attachent.

Un projet peut être défini comme une organisation temporaire qui vise à livrer un objectif spécifique. Comme tel, chaque projet se distingue à part et est caractérisé par des spécificités qui justifient une adaptation des pratiques de gestion (Dov Dvir, Shenhar et Alkaher, 2003). Engwall (2003) argumente que l'étude des structures et pratiques des projets devraient être analysées en relation avec les éléments de son environnement.

En fait, les caractéristiques du contexte d'un projet influencent sa gestion et sa performance. Shenhar et al. (2005) indiquent que l'influence du contexte organisationnel nécessite une adaptation des pratiques de gestion de projets aux spécificités de la compagnie. Ils étudient des projets et programmes à la NASA pour identifier les traits d'un cadre spécifique de gestion de projets à cette organisation. Zwikael et Globerson (2006) se questionnent sur l'influence des industries sur la qualité des pratiques en gestion de projets. En se concentrant sur la planification des projets, les auteurs ont trouvé des différences significatives dans la qualité de la planification entre des groupes d'industries. La gestion de projets est influencée par les industries et leurs pratiques et standards partagés, en plus de l'influence des institutions qui livrent les projets (P. W.

G. Morris et Geraldi, 2011). Sur une autre échelle, la région géographique et le pays d'exécution des projets peuvent aussi influencer le choix des pratiques de gestion de projets et la qualité de leurs applications (Rees-Caldwell et Pinnington, 2013; Rodrigues, Costa et Gestoso, 2014). L'impact de ces influences contextuelles ne veut pas dire une contextualisation systématique des pratiques de gestion de projets. L'identification de toutes les dimensions caractéristiques d'un contexte est difficile. De plus, toutes les pratiques de gestion de projets ne sont pas influencées au même degré; certaines varient plus que d'autres (Besner et Hobbs, 2008). Une solution peut résider dans la typologie et la catégorisation des projets.

La typologie et la catégorisation des projets offrent des opportunités de développement des théories et pratiques en gestion de projets (Niknazar et Bourgault, 2017). Différentes typologies et catégorisations ont été proposées dans la littérature. Shenhar et Dvir (1996) proposent une typologie à deux dimensions des projets; l'incertitude technologique et la portée du système à livrer. Youker (1999) propose une classification des projets basée sur neuf paramètres comme la stabilité de la portée du projet et le degré de nouveauté technologique. Il en a résulté 10 classes de projets comme la construction, la maintenance de processus industriels, et le développement de nouveaux produits. Archibald (2013) détaille une catégorisation des projets selon certains attributs comme la structure du cycle de vie du projet, l'incertitude, le risque, et les aspects contractuels. 12 catégories de projets sont proposées qui comptent par exemple les systèmes de communication, les événements, les systèmes d'information, et les projets de changements organisationnels et d'affaires.

Chaque catégorie, type, ou classe de projet offre des caractéristiques qui peuvent influencer la compréhension des pratiques de gestion de projets et leurs développements. Dans la littérature en gestion de projets, certains contextes ont eu plus d'attention que d'autres. En planification, les projets en construction et en développement de systèmes d'information ont la majorité des recherches sur le sujet. Sans freiner le développement des théories et pratiques en gestion de projet, d'autres contextes offrent des opportunités de recherche et des perspectives différentes.

2.4 Résumé et revue critique de la littérature

La littérature sur la gestion de projets collaboratifs suit deux directions de recherche : gérer la collaboration et gérer en collaboration. La majorité des études ont porté sur des aspects

organisationnels comme les relations interorganisationnelles, ou des aspects technologiques comme le développement de logiciels de collaboration. Un accent sur l'un ou l'autre de ces aspects s'est avéré peu efficace à livrer les bénéfices de la collaboration et participer à la réussite des projets (Shelbourn et al., 2007). Une approche plus inclusive des pratiques de gestion en projets collaboratifs inclurait un aspect procédural comme les processus et les pratiques de gestion spécifiques.

La planification émerge comme la pratique la plus influente sur la qualité du travail collaboratif dans les projets. C'est lors de cette phase en amont de l'exécution que les pratiques collaboratives sont définies et où les parties prenantes ont le plus d'influence sur les décisions clés du projet. Cependant, la littérature traitant des aspects collaboratifs de la planification se concentre souvent sur une activité ou un processus spécifique comme le design. Les perspectives plus inclusives de toutes les dimensions de la planification sont moins présentes. D'un point de vue méthodologique, la planification est rarement analysée comme un processus considérant les activités, les décisions, les intrants, les extrants, et les rôles des ressources. En plus, la pratique de planification collaborative est peu explorée dans la littérature en gestion de projets en comparaison avec d'autres domaines comme la gestion des chaines logistiques. Des concepts comme les entités ou domaines de planification restent à développer dans le contexte des projets.

L'étude en relation avec le contexte est primée dans la littérature comme une des avenues de recherche qui fera évoluer les théories et pratiques en gestion de projets. En fait, la littérature sur la gestion de projets en général, et sur la planification en particulier, est beaucoup plus riche pour les contextes de projets à capitaux comme l'ingénierie et construction ou le développement et implantation des systèmes d'information. Ceci laisse d'autres contextes de projets insuffisamment étudiés. Les transformations d'affaires représentent une catégorie de projets avec des opportunités d'études intéressantes et avec des impacts pratiques prometteurs.

Cette thèse tentera d'adresser ces écarts dans la littérature en combinant trois thèmes de recherche; l'étude de la planification en tant que processus, la découverte des caractéristiques de la planification collaborative, et le tout dans le contexte des projets de transformation d'affaires.

CHAPITRE 3 MÉTHODOLOGIE DE RECHERCHE

Ce chapitre vise à préciser la problématique de recherche de cette étude et à détailler la méthodologie adoptée pour y répondre. Il commencera par faire le lien entre les écarts discutés dans la revue de la littérature et les objectifs précis de cette étude. Par la suite, l'approche générale de recherche sera décrite introduisant deux méthodologies de recherche exécutées en séquence : une approche de recherche-action suivit par une approche d'étude de cas multiples. Les deux méthodologies seront exposées pour en décrire les activités.

3.1 Problématique et objectifs de recherche

La revue de littérature a souligné la nature collaborative des projets et l'importance de la planification pour livrer les projets avec succès. Cependant, les liens entre la collaboration et la planification en gestion de projets restent peu développés comparativement à d'autres domaines d'études, comme la gestion des chaines logistiques, où la planification collaborative a été explorée et développée comme une solution aux complexités engendrées par la nature du travail collaboratif. Cette étude s'intéresse à explorer la planification collaborative dans la gestion de projets.

Les études sur la planification en gestion de projets se sont portées en majorité sur les industries de la construction et des technologies de l'information. La littérature argumente pour un développent des théories et pratiques de gestion de projets selon les contextes spécifiques, comme l'utilisation des catégorisations et typologies de projets. L'adaptation au contexte est aussi une piste de développement des théories et pratiques en gestion de projet. Pour s'aligner avec cette direction de recherche, cette thèse visera le contexte spécifique des projets de transformation d'affaires. Ces projets peuvent être identifiés comme une catégorie à part et ils sont caractérisés par un taux d'échec élevé. L'objectif général de cette étude est d'explorer la nature et les caractéristiques de la planification collaborative pour les projets de transformation d'affaires.

Les études dans la littérature partent souvent des caractéristiques du contexte des projets pour positionner les concepts de planification et collaboration. Dans cette recherche, il sera aussi nécessaire de commencer par décrire les caractéristiques des projets de transformation d'affaires. Ceci permettra de situer les pratiques de gestion de projet, et plus spécifiquement d'analyser la planification et ses particularités. Avec cette compréhension du contexte et des pratiques actuelles de planification des projets de transformation d'affaires, il sera possible de tenter de comprendre

les dimensions de la planification collaboration et comment elle se manifeste, ou d'identifier les exigences d'un processus de planification collaborative. La Figure 3-1 résume les objectifs de cette étude et identifie les questions spécifiques de recherche.

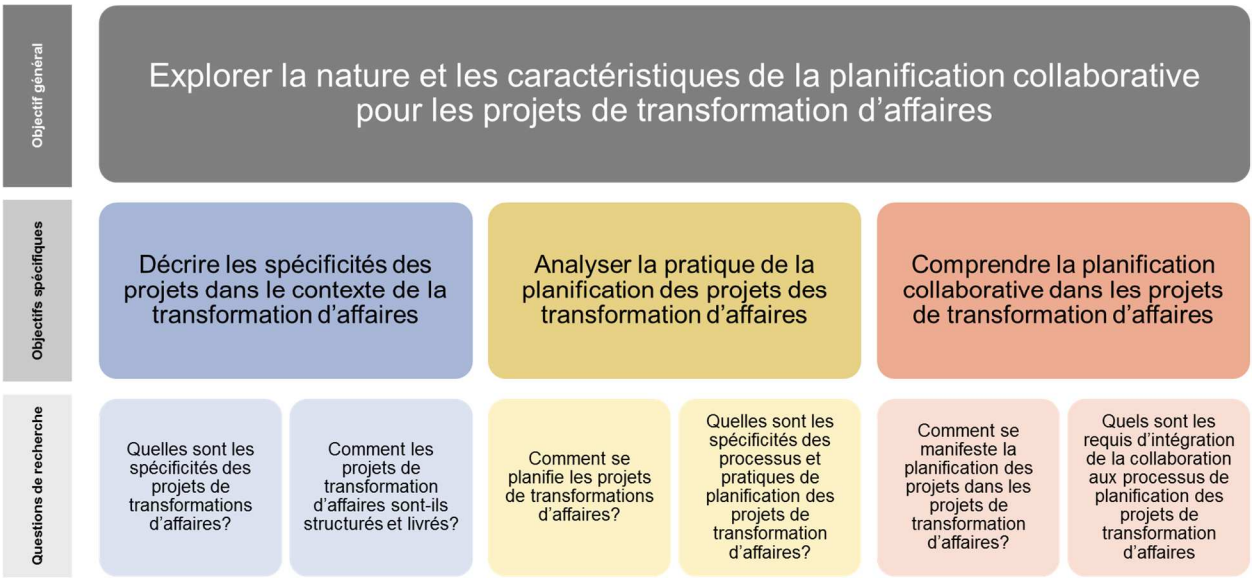

Figure 3-1. Objectifs et questions de recherche

La nature de cette recherche est exploratoire et vise à dévoiler des éléments pour chaque thème de la recherche : le contexte des projets de transformation d'affaires, les processus de planification, et la planification collaborative. Les objectifs spécifiques de la recherche peuvent être atteints par des approches diverses. La section suivante introduira et expliquera la démarche méthodologique adoptée pour cette étude.

3.2 Démarche générale

Pour guider une recherche exploratoire, des approches quantitatives (ex. sondage) et qualitatives (ex. étude de cas) peuvent être utilisées. Le choix de l'approche repose sur l'efficacité de celle-ci à répondre aux questions de recherche, la nature des données recherchées pour l'étude, et l'accessibilité aux données dans le contexte d'étude (Maylor et Blackmon, 2005). Comme mentionné précédemment, les objectifs de cette étude ont un caractère exploratoire : exploration des caractéristiques des projets de transformations, l'exploration des pratiques des processus de planification, et l'exploration du concept de planification collaborative en gestion de projet. Pour avoir accès à des données qui fournissent une compréhension détaillée du contexte organisationnel

et des types de projets, en plus de garantir une découverte approfondie des processus et leurs caractéristiques, les approches qualitatives sont mieux adaptées, plus spécifiquement celles centrées sur les études de cas (Noor, 2008; Yin, 2014).

D'un point de vue pratique, l'atteinte des objectifs de recherche nécessitait un partenariat avec une organisation industrielle. Une analyse des processus et pratiques de planification requiert des données détaillées sur leurs déroulements. De plus, les projets de transformation d'affaires sont délicats pour les organisations, et il est difficile d'en découvrir les caractéristiques sans un accès à des données confidentielles ainsi qu'un contact avec des praticiens et des employés ayant vécu le déroulement et les résultats des projets.

Une approche de recherche en trois phases a été adoptée (voir la Figure 3-2). L'étude a commencé par une phase préparatoire qui cherchait à bâtir les concepts théoriques; à identifier la catégorie de projets à étudier; et finalement à mettre en place une entente de partenariat de recherche avec une organisation industrielle. Par la suite, deux méthodologies de recherche ont été exécutées en série. En premier, une recherche-action participative a permis de mieux comprendre les projets de transformation d'affaires et le contexte organisationnel du partenaire industriel. En second, une étude de cas multiples a permis l'analyse des processus de planification des projets, la collecte des exigences de la collaboration, et l'exploration des caractéristiques de la planification collaborative. Étant donné la nature des données collectées et la participation des employés à des entrevues, l'équipe de recherche a obtenu un certificat de conformité éthique délivré par l'École Polytechnique (référence CER15/16-05).

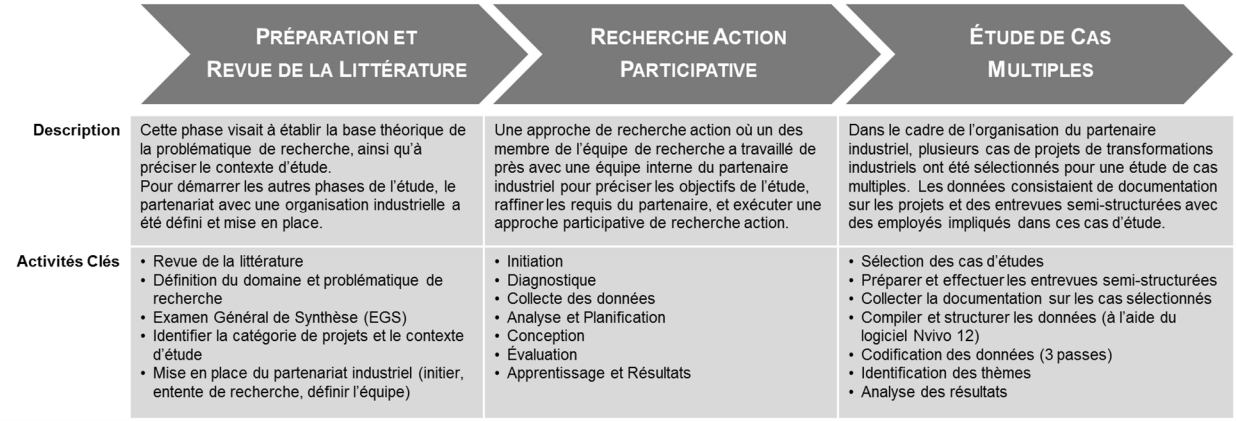

Figure 3-2. Méthodologie de recherche – Démarche générale

3.3 Contexte organisationnel du partenaire industriel

Le choix de l'organisation pour le partenariat de recherche a été principalement fait pour des raisons pratiques. Un des membres de l'équipe de recherche avait accès à des contacts dans l'organisation et la présence de projets de transformation d'affaires a été identifiée. De plus, l'organisation a démontré de l'ouverture à partager des informations sur ce type de projets. En raison de la nature confidentielle de certaines données utilisées dans cette étude, le partenaire industriel et les employés participants seront mentionnés de façon anonyme.

Le partenaire industriel pour cette recherche est une compagnie qui opère dans le domaine du transport et de la logistique. C'est une compagnie cotée en bourses avec une capitalisation de plus de 40 milliards de dollars américains. Les opérations de la compagnie sont aux États-Unis et au Canada. Elle compte un effectif de plus que 22 000 employés dans les deux pays. Depuis une dizaine d'années, la compagnie est considérée parmi les leaders de son industrie, avec des résultats opérationnels les plus performants. La croissance de son marché a été stable pour plus de 20 ans. Dans certains domaines d'affaires, la compagnie a enregistré une croissance à deux chiffres pendant les cinq dernières années. Ceci dit, la compétition directe et indirecte met de plus en plus de pression pour offrir plus de services, surtout en relation avec les technologies de l'information. Pour consolider sa position sur le marché, le partenaire industriel a commencé plusieurs initiatives pour améliorer son offre de services et son modèle opérationnel. Ceci s'est traduit par des projets et programmes, considérés comme transformationnels. Ils couvrent des améliorations de processus, des implantations de systèmes d'information, ou des changements organisationnels. L'équipe de haute direction a entamé une discussion sur les approches possibles d'implanter les changements et maximiser les chances de succès.

Ce partenariat de recherche représentait alors une opportunité pour l'organisation visant à aider à la compréhension des projets de transformation d'affaires, comment les planifier, et comment les exécuter. L'entente de recherche avait comme objectif pratique pour le partenaire industriel de développer une approche de transformation d'affaires adaptée à son contexte et à ses exigences spécifiques. D'un autre côté, l'équipe de recherche a eu accès à des données sur des cas de projets, ainsi qu'à des employés ayant participé à ces initiatives transformationnelles.

3.4 Recherche-action participative

La combinaison des besoins du partenaire industriel pour la résolution de problème et les intérêts de recherche d'étudier en profondeur des phénomènes en pratique convient bien à la définition d'une recherche-action (Susman et Evered, 1978). Plus spécifiquement une approche de recherche-action participative permet une collaboration entre chercheurs et partenaires industriels à planifier et exécuter des activités de recherche en itérations (Chein, Cook et Harding, 1948). La Figure 3-3 résume l'approche itérative de recherche-action adoptée dans cette étude. De plus, la section de la méthodologie de recherche de l'article 1 détaille cette approche en relation avec les objectifs de recherche et du partenariat industriel (voir Chapitre 5).

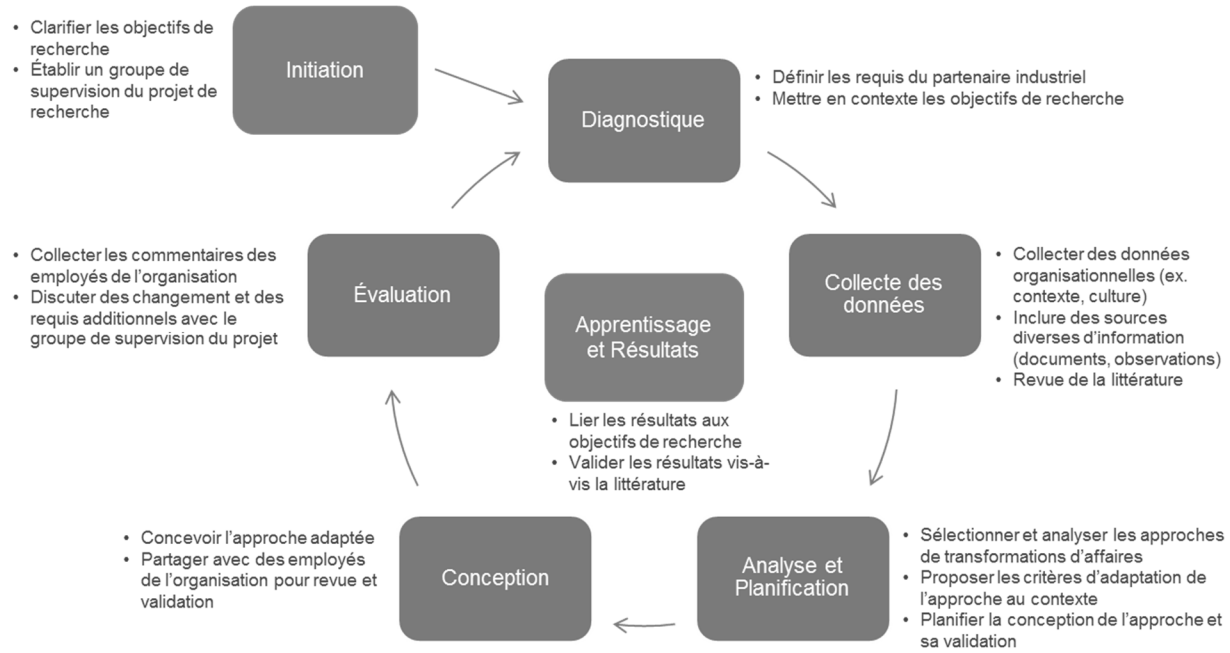

Figure 3-3. Méthodologie de recherche – Recherche action participative

3.5 Étude de cas multiples

L'approche de recherche-action a permis de mieux comprendre le contexte organisationnel du partenaire industriel. Aussi, elle a permis une exploration approfondie des projets de transformation d'affaires et des différents concepts qui les entourent. La dernière phase de l'approche de recherche s'est concentrée sur les études de cas multiples. Elle a visé à analyser en profondeur les concepts

de planification, de collaboration et les relations entre les deux pour les projets de transformation d'affaires.

La Figure 3-4 résume l'approche d'étude de cas multiples adoptée. La section de méthodologie de recherche de l'article 2 décrit sommairement chaque étape de cette méthodologie (voir Chapitre 6). Dans ce qui suit plus de précisions pour chacune des étapes.

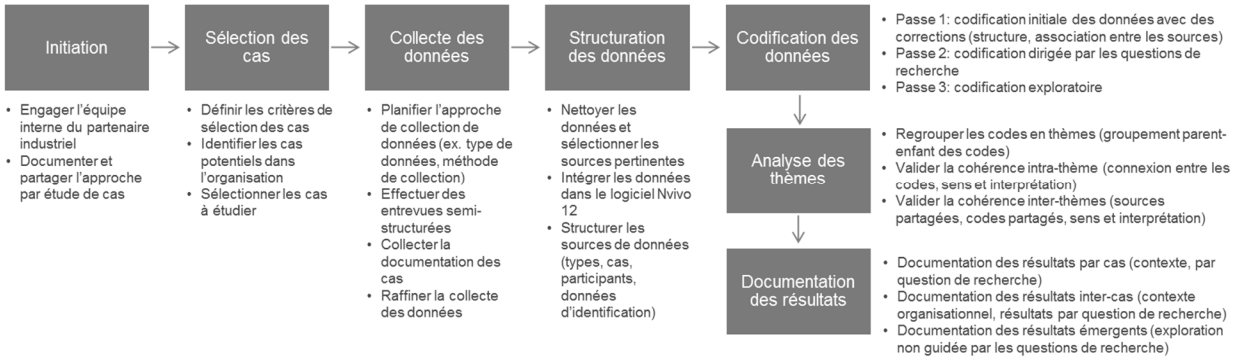

Figure 3-4. Méthodologie de recherche – Étude de cas multiples

3.5.1 Initiation

L'équipe de recherche a préparé un plan sommaire des activités de recherche. Ce plan a permis d'engager l'équipe interne du partenaire industriel, et amorcer les discussions sur les critères de sélection des cas. Cette étape a aussi permis d'identifier les sources potentielles de données; par exemple, les sites SharePoint des projets où toute la documentation devrait être archivée.

3.5.2 Sélection des cas

En partant de la revue de la littérature sur la nature de la transformation d'affaires, les processus de planification des projets, et la collaboration, l'équipe de recherche a préparé une liste de critères initiaux des cas. Par la suite, des sessions de travail avec l'équipe interne du partenaire industriel ont permis de définir et formaliser les critères de sélection des projets. L'idée était d'avoir une variété en nature de projets, les équipes impliquées, et l'ampleur des changements perçus à la fin.

Le premier groupe de critères est inspiré de la littérature et vise à assurer des données qui couvrent le contexte des transformations, le processus de planification et les exigences de la collaboration. Ces cirières peuvent être résumées comme suit :

- Les caractéristiques du projet : regroupent des données sur la taille du projet (ex. nombre de personnes impactées), sa durée totale, sa structure (ex. un projet, un programme avec projets multiples).
- La portée de la transformation : relativement au contexte de l'organisation, ce critère évalue le type de changement apporté (ex. procédure de travail, comportement des employés), son niveau de radicalité, ainsi que le moyen principal d'implantation (ex. processus, technologie)
- La planification : une évaluation sommaire du type de planification effectuée dans le projet (ex. est-ce qu'un plan de projet existe ? Est-ce que le processus est formel ?)
- La collaboration : une évaluation de quelques aspects de la collaboration comme le nombre d'équipes ou départements en interactions, la taille de l'équipe du projet, une évaluation qualitative de la nature des relations entre les parties prenantes.

Le second groupe de critères de sélection est de nature pratique. Les contraintes du partenaire industriel ont été prises en compte. De plus, ces critères permettent de minimiser les risques de retards dans la collecte de données. Ils peuvent être résumés comme suit :

- Les projets terminés sont préférés à ceux qui sont en cours. Ceci améliore les chances d'accès à des ressources clés sur les projets, et minimise la perturbation de l'avancement des équipes de projets. De plus, les projets terminés auront plus de données à offrir à l'étude.
- Les projets où un membre de l'équipe interne du partenaire industriel a participé sont préférés. Les membres de l'équipe interne permettent d'avoir une mise en contexte plus rapide sur les projets et facilitent la collecte des données.
- Les projets avec une documentation et des membres participants accessibles sont préférés. Le niveau de détail de la documentation peut varier. Cependant, certains projets ont des archives de documentation plus accessible que d'autres. Certains projets ont eu des ressources temporaires pour les livrer. Ainsi, le choix du projet doit maximiser les chances d'avoir des participants encore employés dans l'organisation.

La sélection des projets s'est faite itérativement. L'équipe interne du partenaire industriel a proposé une liste de six projets qui répondent aux critères de sélection. Et suite à des sessions de travail et une exploration initiale des données disponibles, quatre cas ont été sélectionnés. La sélection des

cas a été finalisée en février 2015. Le Tableau 3-1 résume les critères utilisés et leurs applications aux quatre cas sélectionnés.

Tableau 3-1. Grille de sélection des cas

Critères de sélection	Projets sélectionnés – Les 4 cas			
	Cas 1	**Cas 2**	**Cas 3**	**Cas 4**
Critères généraux				
Durée (en mois)	13	36	36	24
Statut	Fermé	Fermé	En cours	Fermé
Succès ou échec	Succès	Succès	Non déterminé	Échec
Structure	Projet	Programme	Projet	Programme
Critères de transformation[5]				
Perception du changement	Changements importants aux processus et systèmes d'information	Changements radicaux à la culture de travail de l'organisation, accompagnés de changement de processus et de systèmes d'information	Changements importants du comportement d'un groupe d'employés, accompagnés d'une redéfinition des processus	Changements importants à plusieurs systèmes d'information
Portée du changement	Un département	La compagnie	Un département	Trois départements
Dimension principale	Processus	Stratégie	Processus	Système d'information
Niveau de risque	Gérable	Très élevé	Élevé	Très élevé
Critère de planification				
Planification formalisée	Oui	Non	Oui	Oui
Plan de projet	Existent	Inconnu	Existent	Existent
Critère de collaboration				
Nombre de parties prenantes	4	5	5	3
Taille de l'équipe de projet	20 à 30 personnes	Plus que 100 personnes	30 à 50 personnes	Plus que 100 personnes

[5] Les critères de transformation sont évalués à l'aide de l'équipe interne du partenaire industriel. L'évaluation est relative au contexte de l'organisation.

3.5.3 Collecte des données

Pendant la phase précédente de l'approche de recherche, l'équipe de recherche a collecté des données et des observations sur le contexte organisationnel du partenaire industriel. Ces données étaient en majorité des documents internes ou de l'information disponible pour les investisseurs et les actionnaires.

Dans cette phase, la collecte de données s'est concentrée sur les cas sélectionnés et leurs contextes spécifiques. Deux sources de données ont été visées : la documentation des projets ou programmes, et des entrevues semi-structurées avec des participants dans chaque cas. Des observations ont aussi permis de compléter et de raffiner les données documentées et les entrevues. La collecte des données s'est faite entre octobre 2015 et juin 2016. Et les données des cas sélectionnés couvraient une période de six ans entre 2010 et 2016.

La documentation des cas a été en majorité trouvée dans des sites SharePoint dédiés pour chaque projet ou programme. Les participants aux entrevues ont aussi partagé d'autres documents. La difficulté résidait à filtrer l'ensemble des documents disponibles et réduire le nombre à ceux pertinents à cette étude. Ceci a été fait en itération. En premier, les documents ont été catégorisés en utilisant les métadonnées (ex. titre, phase du projet, versions), ce qui a permis de réduire le nombre de documents. Deuxièmement, les documents ont été consultés un par un pour une lecture sommaire et les catégoriser encore selon leur contenu. Finalement, les recommandations des participants aux entrevues ont permis d'appliquer un dernier filtre pour arriver à la liste finale des documents à analyser pour chaque cas.

Pour commencer les entrevues, une liste de participants dans chaque cas a été établie à l'aide de l'équipe interne du partenaire industriel. Cette liste a été révisée et raffinée suite aux premières entrevues en se basant sur les recommandations des participants. La sélection des participants a visé la diversité des perspectives sur chaque cas, sa planification, et la nature de la collaboration durant sa livraison. Le nombre de participants a été limité pour chaque cas pour privilégier des entrevues plus longues, couvrant ainsi plus en profondeur les questions et les phénomènes à étudier. Un guide d'entrevue a été bâti pour accompagner l'équipe de recherche, et assurer une cohérence de structure et de questions entre les participants (voir Annexe A pour plus de détails).

Les entrevues ont été transcrites, et la collecte des documents compléter à la lumière de recommandations des participants. Par la suite, les données ont été structurées par cas, et par sources (entrevues ou documentation).

3.5.4 Structuration des données

Le logiciel Nvivo 12 a été choisi pour accompagner la structuration des données et faciliter la codification par la suite (Bazeley et Jackson, 2013). Les données ont été transférées dans la base de données Nvivo, et structurées selon leurs sources; entrevues et documentation. En utilisant les fonctionnalités de métadonnées de Nvivo, les différents documents et transcriptions d'entrevues ont été associés aux cas et aux participants des entrevues. La base de données Nvivo a été aussi enrichie avec des observations et des annotations qui permettent de lier les données et mieux comprendre leurs contextes d'interprétation.

3.5.5 Codification des données

La codification des données dans Nvivo se fait en associant des documents, des sections, ou une portion du texte à un nœud (*node*). Les nœuds de codification peuvent être prédéfinis ou aussi créés spécifiquement pour les données analysées. Les deux façons de codifier les données sont associées à deux approches d'analyse des données qualitatives : une approche dirigée et une approche exploratoire (V. Braun et Clarke, 2006). Pour commencer, les données ont été codifiées en même temps que la structuration. Ceci permet d'associer des sources de données ensemble et de bâtir une structure initiale des codes et des thèmes. L'approche dirigée permet d'analyser les données en utilisant les questions de recherche comme guide de codification et d'identification des thèmes. L'approche exploratoire complète l'aspect dirigé en découvrant des concepts émergents des données et identifier de nouveaux thèmes. La Figure 3-5 résume les éléments clés de chaque approche de codification des données.

Le résultat de la codification est un arbre de codification sous une hiérarchie parent-enfant. Les thèmes d'analyse sont les nœuds parents. Le logiciel Nvivo permet de regrouper les références des données au niveau des nœuds parents. L'annexe B contient un extrait des codes et thèmes incluant le nombre de sources de données attachées et le nombre des différentes références dans les données.

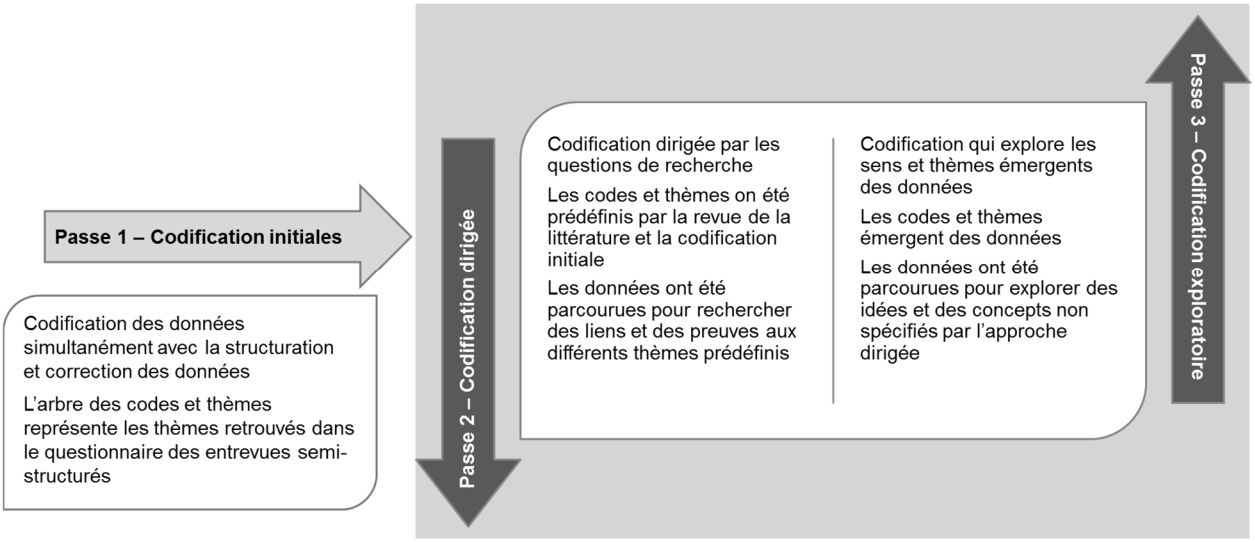

Figure 3-5. Méthodologie de recherche – Étude de cas multiples - Approche de codification des données

3.5.6 Analyse des thèmes

L'analyse des thèmes a commencé par une relecture des références attachées à chaque code (nœud). Ceci a permis de raffiner la compréhension du concept identifié par le nœud, et aussi de changer son attache parent-enfant quand c'est pertinent. De plus, cette revue permet de dupliquer des nœuds qui peuvent être attachés à plus qu'un nœud parent. Par la suite, une revue des données et nœuds enfants sous un même nœud parent a été faite. Cette revue permet de vérifier la cohérence des données sous un même thème. Ensuite, une comparaison des nœuds parents a été faite pour identifier les données partagées, et s'assurer de la cohésion des relations entre les thèmes identifiés. Certaines modifications ont été nécessaires. Par exemple, deux thèmes existaient qui partageaient une grande proportion des références. Ces nœuds ont été combinés pour augmenter la cohérence entre les nœuds parents. Finalement, la structure des nœuds et leurs liens ont été révisés pour ajouter un ordre d'identification qui clarifie les liens parent-enfant, et préparer les thèmes pour une documentation des résultats. L'annexe B présente des exemples de visualisation des thèmes et codes en utilisant Nvivo 12.

3.5.7 Documentation des résultats

L'étape de documentation des résultats inclut aussi une analyse des thèmes et leurs sens. La documentation a été exécutée en trois étapes (voir Figure 3-6). La première étape utilise certaines

fonctionnalités de visualisation et d'extraction de rapports de Nvivo 12. Les résultats sont ainsi extraits de la base de données Nvivo pour être raffinés manuellement (ex. ajouter un autre niveau de regroupement des thèmes si nécessaire). La deuxième étape revoit les résultats pour chaque cas individuellement et les documente sous une même structure qui facilite leur comparaison. À cette étape, un document de cas a été le livrable. La troisième étape revoit tous les résultats et compare les cas pour détecter les éléments partagés et les différences. Un document d'analyse inter-cas regroupe ainsi ces éléments comparatifs.

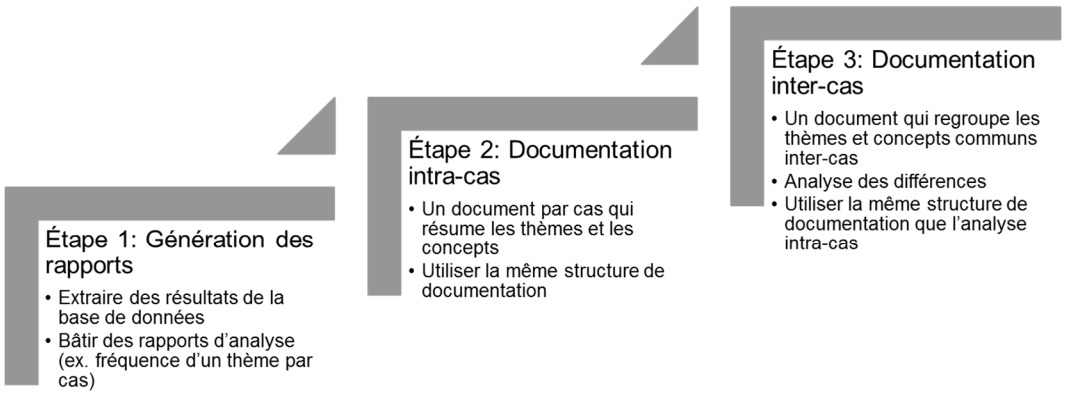

Figure 3-6. Méthodologie de recherche - Étude de cas multiples – Documentation des résultats

3.5.8 Aperçu des données

Les données sont structurées par cas dans la base de données Nvivo. Les deux sources de données principales sont les entrevues semi-structurées et la documentation. Des observations et des notes de recherche ont aussi complété certaines informations comme une troisième source de données. Le Tableau 3-2 résume les cas sélectionnés et donne un aperçu sur les données associées.

Les analyses de données des cas multiples ont permis la génération des résultats discutés dans les articles 2, 3 et 4.

Tableau 3-2. Aperçu des cas sélectionnés et des données associées

Cas	Description	Nombre de participants aux entrevues	Durée des entrevues (min)	Nombre de documents sélectionnés
Cas 1	Un projet au niveau départemental qui a visé la réingénierie d'un processus d'affaire accompagnée d'une implantation d'un nouveau système d'information. Le projet a été considéré un succès par toutes ses parties prenantes. Il s'est terminé à temps, en bas du budget et en livrant ses objectifs d'affaires.	6	516	120
Cas 2	Un programme initié par le président de la compagnie qui a visé des changements dans toute l'organisation. L'objectif était de changer la culture opérationnelle de toutes les équipes vers un accent sur le service à la clientèle. Le programme a inclus des projets de changements organisationnels, de réingénierie de processus, et d'implantation de nouveaux systèmes d'information. Les bénéfices du programme ont été considérés atteints, même si certains projets du programme ont été considérés comme des échecs.	4	293	43
Cas 3	Un projet au niveau départemental a visé la réingénierie de l'approche de gestion et d'exécution des opportunités et des demandes. Aucune composante technologique n'a été introduite dans ce projet. Le changement des habitudes de gestion et le comportement des employés ont été très importants. Au moment de la collecte des données, ce projet était encore en déploiement du nouveau processus.	4	344	51
Cas 4	C'est un programme qui visait le remplacement et l'implantation de multiples systèmes d'information en même temps. Tous les changements été en relation avec un domaine d'affaire de la compagnie. Le programme incluait cinq projets technologiques. Ce programme a été considéré comme un échec par toutes ses parties prenantes. Un échec qui s'est traduit par une perte financière pour l'organisation.	5	465	120
Contexte	Des informations sur le contexte général de l'organisation. Ceci inclut des informations sur les opérations et modèles d'affaires de la compagnie. Ça inclut aussi des exemples d'autres projets de transformation d'affaires qui n'ont pas été retenus comme cas d'étude.	2	131	16
	Total	**21**	**1749**	**350**

En résumé, la méthodologie de recherche adoptée a combiné une approche recherche-action avec une étude de cas multiples dans l'organisation du partenaire industriel. Exécutée en deux phases, la méthodologie de recherche s'aligne avec le type d'étude exploratoire visée et a permis la collection des données requise pour l'analyse et la génération des résultats.

CHAPITRE 4 PRÉSENTATION DES ARTICLES

Le chapitre précédent a décrit la méthodologie de recherche. Ce chapitre connectera les résultats obtenus aux phases et étapes de cette méthodologie ainsi que leurs liens aux objectifs de recherche. Les contributions de cette étude sont regroupées en quatre articles scientifiques. Le Tableau 4-1 résume la contribution de chaque article, les liens avec les objectifs de recherche, et la phase ou étape de la méthodologie de recherche qui a généré les résultats.

Tableau 4-1. Résumé des contributions en lien avec la démarche de recherche

Article	Contribution	Lien avec les objectifs de recherche	Méthodologie de recherche
Article 1	Développer et adapter une approche de transformation d'affaires pour un contexte organisationnel spécifique. Des approches de transformation d'affaires dans la littérature ont été comparées et analysées.	• Développer une connaissance approfondie de la catégorie de projet à étudier : la transformation d'affaires. • Comprendre le contexte organisationnel du partenaire d'affaires dans lequel les cas de projets seront étudiés.	Recherche-action participative
Article 2	Évaluer la planification des projets de transformation d'affaires en utilisant une approche d'analyse par processus avec des études de cas multiples.	• Analyser la situation actuelle des pratiques et processus de planification des projets de transformation d'affaires. • Identifier des opportunités d'amélioration et des liens potentiels avec la collaboration.	Étude de cas multiples : analyse dirigée (codification et thèmes dirigés par des questions issues de la revue de la littérature)
Article 3	Évaluation de l'adaptation de la pratique de la planification conceptuelle d'autres catégories de projets aux transformations d'affaires.	• Analyser la situation actuelle des pratiques et processus de planification des projets de transformation d'affaires. • Identifier des caractéristiques de la planification pour les projets de transformation d'affaires.	Étude de cas multiples : analyse exploratoire (codification et thème émergent des données sans questions dirigeantes)
Article 4	Exploration du concept de la planification collaborative pour les projets de transformations d'affaires, ainsi que l'identification des exigences pour un processus collaboratif de planification.	• Clarifier les liens entre planification et collaboration • Identifier les exigences de la collaboration pour un processus de planification des projets.	Étude de cas multiples : analyse dirigée (codification et thèmes dirigés par des questions issues de la revue de la littérature)

4.1 Article 1: Comparaison et adaptation des approches de transformation d'affaires

Étant donné le choix des transformations d'affaires comme la catégorie des projets d'intérêt pour cette étude, le premier objectif de recherche visait à comprendre et analyser les particularités de ce contexte. Une approche de recherche-action participative a été utilisée pour atteindre cet objectif et pour aligner aux exigences du partenaire industriel.

L'article 1 revoit la littérature sur les approches de transformation d'affaires pour en sélectionner trois afin de les comparer et d'analyser leurs particularités. L'approche de recherche-action participative a permis de comprendre le contexte transformationnel du partenaire industriel. De plus, des exigences et des questions ont été définis avec une équipe interne pour guider la recherche.

Le résultat principal de l'article 1 est la proposition d'une approche adaptée de transformation d'affaires au contexte du partenaire industriel. D'un point de vue pratique, le partenaire industriel peut utiliser cette approche adaptée pour guider la livraison des projets de transformations futures. Pour la littérature scientifique, l'article 1 propose des éléments qui guident l'adaptation des approches de transformation à un contexte organisationnel spécifique. En plus, l'approche de recherche participative adoptée est de nature descriptive, et complète les approches existantes dans la littérature qui sont plus de nature prescriptive.

L'article 1 a permis d'explorer les particularités des projets de transformation d'affaires; à travers une revue de la littérature, et à travers un contact direct d'un contexte organisationnel. Les efforts d'adaptation d'une approche adaptée à son contexte ont convaincu le partenaire industriel de la valeur d'explorer les autres questions de recherche. La contribution de l'article 1 a facilité l'engagement du partenaire industriel pour collecter des données confidentielles sur des projets de transformation pour en étudier la planification et ses liens avec la collaboration.

4.2 Article 2: Évaluation des processus de planification des projets de transformation d'affaires

Le deuxième objectif de cette étude est d'analyser les processus de planification des projets dans le contexte des transformations d'affaires. L'article 2 utilise les données collectées dans l'organisation du partenaire industriel pour répondre à cet objectif.

L'étude de cas multiples a fourni les données pour analyser les processus de planification des projets sélectionnés. La base de données des documents et des entrevues a été analysée suivant une approche dirigée. Ceci a permis de cartographier les processus de planification sous un formalisme BPMN (Business Process Modeling Notification). L'article 2 présente les résultats d'une analyse de la planification dans les cas d'étude qui couvrent les dimensions : organisation (*people*), processus (*process*), et technologie (*technology*).

L'article 2 souligne deux résultats principaux. En premier, il indique que les processus de gestion de projets ont été développés pour les projets de construction et de systèmes d'information, et ils ne sont pas tout à fait adaptés au contexte des transformations d'affaires. Ce résultat rejoint un argumentaire dans la littérature vers plus d'adaptation des pratiques de gestion de projets aux différents contextes et catégories de projets. Deuxièmement, l'article 2 identifie, à partir des cas étudiés, l'importance d'une bonne gouvernance des projets et des compétences de leadership pour une planification efficace. De plus, les cas étudiés utilisent un nombre limité de livrables de planification en comparaison avec les standards et référentiels en gestion de projet.

Les résultats de l'article 2 répondent directement au deuxième objectif de recherche de cette étude. À travers l'étude des cas multiples, il donne une évaluation de l'état actuel de la pratique de planification dans un contexte de transformation d'affaires. Aussi, l'approche d'analyse par processus a permis d'identifier des pistes d'amélioration des processus de planification pour les adapter aux transformations d'affaires.

L'article 2 identifie une opportunité d'explorer plus les pistes d'adaptation des pratiques et processus de planification des projets aux contextes des transformations d'affaires. Certaines pratiques de gestion de projets dans le contexte de la construction ou les systèmes d'information pourraient être transposées à d'autres contextes.

4.3 Article 3: La planification conceptuelle dans les projets de transformation d'affaires

L'article 3 complète l'évaluation des processus de planification des projets de transformation initiée dans l'article 2. Le deuxième objectif de recherche incluait une exploration des opportunités d'amélioration des processus actuels de planification. En fait, l'article 3 répond par un exemple spécifique à cette partie de l'objectif. Il évalue la pratique de la planification conceptuelle comme

une transposition possible du domaine de la construction au contexte de la transformation d'affaires.

L'article 3 repose aussi sur les données de l'étude de cas multiples. Cette fois-ci, l'approche d'analyse des données exploratoires a fait émerger des thèmes qui peuvent être associés à la planification conceptuelle dans les projets d'ingénierie et construction. L'article 3 revoit la planification conceptuelle et son évolution pour les projets d'ingénierie et construction. La raison d'être et la valeur de la planification conceptuelle ont été prouvées dans la littérature de gestion de projets en ingénierie et construction. Mais la pratique n'a pas été évaluée pour d'autres contextes de projets, les transformations d'affaires incluses.

L'article 3 contribue à la littérature en explorant l'application de la planification conceptuelle dans les projets de transformation d'affaires. L'article renchérit l'argument de l'adaptation des pratiques de gestion de projets aux contextes. Il identifie six éléments de planification conceptuelle présents dans les cas étudiés : la gouvernance, le design, les règles et principes de planification, la stratégie de livraison, l'horizon de planification, et le niveau de planification. Les particularités de leurs applications dans un contexte de transformation d'affaires sont aussi discutées.

En lien avec la structure de cette étude, l'article 3 explore une opportunité d'amélioration des processus de planification des projets de transformations d'affaires. La deuxième opportunité d'amélioration que cette étude vise à explorer est la description des liens entre la planification et la collaboration.

4.4 Article 4: Dimensions et exigences de la planification collaborative dans les projets de transformation d'affaires

Le troisième objectif de recherche est de décrire la nature de la collaboration dans les projets de transformation d'affaires et ses exigences pour les processus de planification. Ceci peut être accompli par une exploration des manifestations de la collaboration dans les cas étudiés. Le défi est d'identifier comment la collaboration et la planification sont connectées, et que représente la planification collaborative dans le contexte des projets de transformation d'affaires. L'article 4 explore les liens entre la collaboration et la planification.

Comme l'article 2, l'article 4 utilise une approche directive d'analyse des cas multiples. Les données des cas sélectionnés ont été codifiées pour identifier des thèmes touchant la collaboration,

et plus spécifiquement la planification collaborative. La planification collaborative est une pratique existante dans d'autres domaines de recherche comme la gestion des chaines logistiques. Cependant, très peu de recherches couvrent son application en gestion de projet. L'article 4 est une étude exploratoire des dimensions de la planification collaborative, en utilisant une approche par étude de cas, et dans le contexte spécifique des projets de transformations d'affaires.

Les résultats de l'article 4 indiquent une difficulté de définir la nature de la collaboration pour les participants et membres des équipes de projets étudiés. Ceci rejoint la littérature sur la collaboration dans les organisations. Les chercheurs en collaboration proposent différentes définitions de la collaboration selon le contexte de l'étude. L'article identifie deux dimensions de la planification collaborative; la planification de la collaboration, et la planification en collaboration. Pour la première, la collaboration est un effort et un coût à tenir en compte lors de la planification. Pour la deuxième, la collaboration est un attribut du processus de planification. Finalement, l'article 4 explore les exigences d'un processus collaboratif de planification en les structurant selon les aspects d'échange d'information, de coordination, et de prise de décision conjointe.

Ainsi, l'article 4 propose une structure pour étudier la planification collaborative des projets de transformations d'affaires. En identifiant des exigences pour rendre le processus de planification collaboratif, l'article répond donc au troisième objectif de la recherche. Dans sa discussion, l'article pointe vers une piste de développement d'un modèle de planification collaborative en utilisant la théorie et les outils de l'ingénierie de la collaboration (Kolfschoten, Vreede, Briggs et Sol, 2010).

En résumé, l'article 1 utilise une recherche-action participative pour aborder la catégorie des projets de transformation d'affaires et répondre au premier objectif de cette étude de décrire les spécificités de ce contexte de projets. L'article 2 utilise la codification dirigée des cas multiples pour atteindre le deuxième objectif de recherche d'analyser les processus de planification des projets de transformation d'affaires. L'article 3 utilise la codification exploratoire pour bonifier les résultats trouvés pour le deuxième objectif en faisant un lien de transposition entre le contexte des projets en ingénierie et construction et celui des projets de transformation d'affaires. Finalement, l'article 4 a permis d'atteindre le dernier objectif de recherche en identifiant les dimensions et exigences de la planification collaborative. Dans les quatre chapitres suivants, chaque article sera présenté tel qu'il a été soumis à une revue scientifique avec comité de lecture.

CHAPITRE 5 ARTICLE 1: BUSINESS TRANSFORMATION FRAMEWORKS: COMPARISON AND INDUSTRIAL ADAPTATION

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Abstract

As a radical and risky change approach, business transformation enables organizations to add substantial value and help overcome major environmental pressures. The academic and practice literature suggests business transformation frameworks to guide organizations through such a journey. This article presents a comparative analysis of three business transformation frameworks from the literature. It concludes that business transformation frameworks are complementary and their use depends on the organizational context. This analysis is then leveraged to develop an adapted framework to a specific industrial situation. The article outlines the characteristics of this specific industrial context and how it influences the adaptation of a business transformation framework. An overview of the adapted framework is presented.

Keywords: business transformation, frameworks, industrial adaptation

5.1 Introduction

The dynamics of the organizational context, whether internal or external, are invariably shifting. This makes change a constant reality for organizations. Technological advancements and economic constant evolution are considered as the main factors accelerating the pace of changes (Faeste et al., 2014; Rouse, 2005a). Change also varies in scope and radicalness, and remains heavily dependent on organizations' contexts (Armenakis et Bedeian, 1999). To help structure, conduct and maximize the benefits of change initiatives, both researchers and practitioners have suggested various principles and guidelines (Todnem, 2005).

This article focuses on business transformation as a radical and risky change approach. Part of a university industry collaboration, this article's objective is to compare some business transformation frameworks, and particularly to build an adapted framework to the industrial partner's context. As such, the adapted framework needs to be specific and tailored to the industrial partner's needs and organizational characteristics.

Business transformation is a change approach where both the level of radicalness of changes and the expected value of results are high. It may then impact various dimensions of the organization; strategy, people, processes, information, and technology. It aims to bring substantial added value translated into fundamental remodeling to how work is done and how value is delivered. Its scope involves the complex and interrelated aspects of organizations, such as multiple internal and

external stakeholders. It is also seen as a holistic and integrative approach that addresses the complexities and risks of such a radical change (Purchase et al., 2011).

Business transformations occur for a variety of reasons. Organizations may decide to transform in response to a radical and immediate change to survive. For example, the rise of electronic and mobile devices threatened the profitability and even the existence of the printing and book industry (Economist, 2011). Companies in this industry faced challenging economic and financial situations in which urgent and radical change was required. By contrast, some organizations launch business transformations to enable future growth and surpass competition. This was the situation for Lockheed Martin Aeronautics Company, which initiated in 2000 significant changes to its structure and management disciplines to overcome financial inefficiencies, strategic misalignment and react to customers' feedback (Kessler, 2002).

One of the challenges organizations face is making the choice of a business transformation framework and deciding how to adapt it to their context. Facing the lack of evidence about change approaches in general (Appelbaum, Habashy, Malo et Shafiq, 2012), organizations would generally rely on experts and consultants to define how business transformations should be conducted. Thus, organizations are confronted with different approaches that may seem similar and which results cannot be measured. With some exceptions, most frameworks are publicized as a winning formula to successfully transform an organization. This is at odds with the few quantitative studies on change initiatives indicating an important failure rate ranging between 44 and 70 percent (McKinsey, 2008b; Nohria et Beer, 2000).

This article will start with presenting the research methodology. Then, a literature review of business transformation study field is performed, and provides an overview of business transformation frameworks. A further analysis and comparison of three selected frameworks follows. Finally, the industrial partner's context will be presented, followed by an outline of the adapted framework. The article will conclude with a discussion about the challenges faced in this research, especially in the effort to combine and adapt existing frameworks to a specific context.

5.2 Research Methodology

As with many large corporations, the industrial partner of this research is facing emerging technologies, important market changes, and major new regulatory requirements in one of the

countries where it operates. Its leadership team has opened discussions on the need for business transformation and how it should be conducted for the best chances of success. This research was then initiated to develop a business transformation framework that is adapted to the industrial partner's context, and integrates its organizational characteristics.

Based on Susman and Evered (1978) definition, the industrial partner's need for problem solving and development, combined with the research interest to investigate business transformation context and how it influences its frameworks, fits well with the definition of action research. Specifically, a participative action research as defined by Chein, Cook, and Harding (1948) allows a collaboration between the industrial partner as the client system and the researchers in diagnosing and planning of actions. Figure 5-1 outlines the research methodology anchored in action research process.

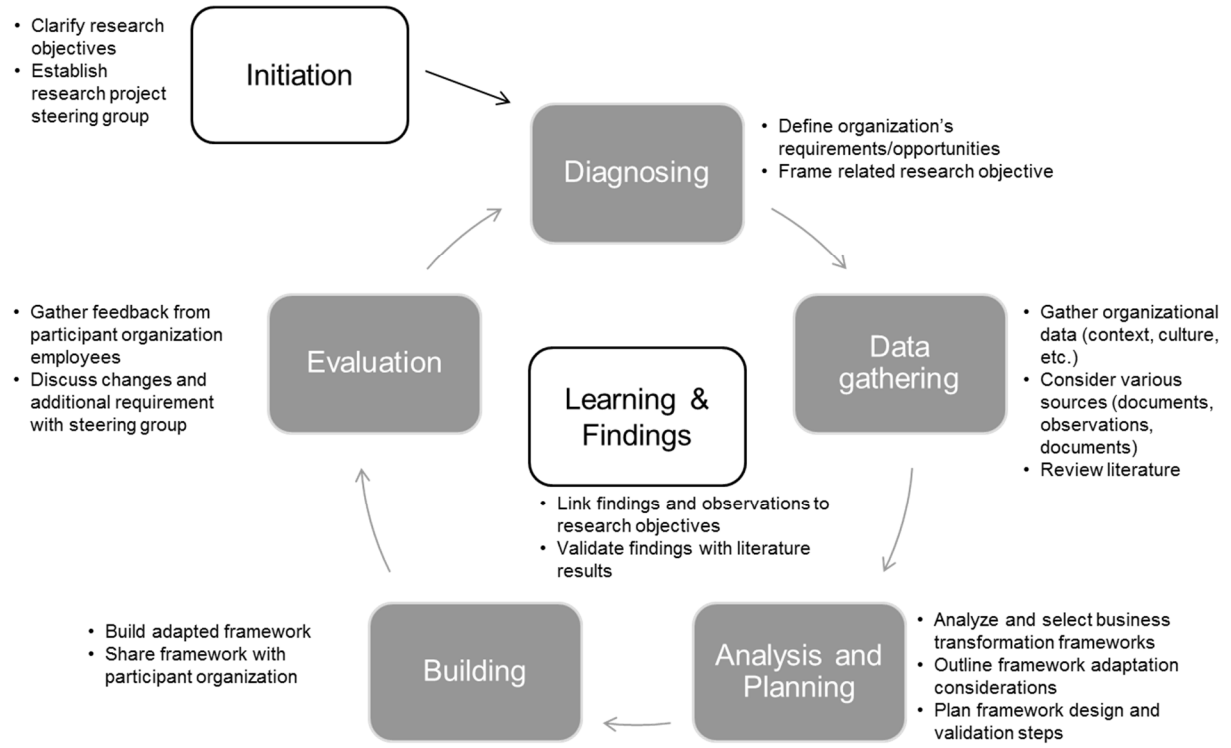

Figure 5-1. Research Methodology - Participative Action Research

As the research objective is to leverage existing theory towards a practical application to a specific situation, the research approach required a grounding in existing literature, backed by an action research approach (Aubry, Richer et Lavoie-Tremblay, 2014). As an initiation of the research project, members of the organization were identified as key contacts and support to the researchers.

These members and the researchers constitutes the research steering group (Coughlan et Coghlan, 2002).

The research team started by clarifying the theoretical and empirical requirements to support such a request. The following questions emerged:

- What is the difference or relation between business transformation and other change approaches (mainly business process reengineering and continuous improvement)?
- How is business transformation delivered in organizations?
- What are the success factors of business transformation?

Then started a data gathering step to collect information about the organizational context and characteristics. The research team worked with the industrial partner to study its characteristics, context and any factors that can affect the adaptation and adoption of a business transformation framework. Workshops and meetings were conducted. Through iterations, data about the organization's particular culture, history and current structure was collected. In addition, discussions about the characteristics of previous business transformation initiatives at the organization were held, in parallel with reviewing existing literature on the subject. Business transformation is an area that combines different practices. As an example, Uhl and Gollenia (2013) define business transformation as the integration of management disciplines, such as strategy management, IT management, and change management. Consequently, the literature review started with "transformation" as the central search keyword. As different authors referred to business transformation with other terminologies such as: "change", "organizational change", "radical transition", or "reengineering", these terms were included in the search keywords. A summary of this literature review is presented in section 5.3.

Next came an analysis and planning step. It aimed at understanding the nature and characteristics of business transformation initiatives and to identify frameworks and methodologies guiding them. In addition, it allowed the identification of guidelines on how to adapt these frameworks to the specific situation and context of the industrial partner.

The literature review revealed a multitude of approaches presented as business transformation frameworks. Comparing all of the frameworks was found to be unrealistic, as they present different structures and theoretical backgrounds. In addition, the research industrial partner was looking for

a detailed “how-to” guide to conduct a business transformation. After discussions on what these expectations entail, it was concluded that a fair level of details about the frameworks to be studied is required. Three elements were identified as defining and selection criteria of the frameworks to be kept for further analysis. Consequently, and for the purpose of this research, a framework is considered as any approach or structure that has three elements:

1. Principles: a set of theoretical and guiding ideas that the framework will concretize;
2. Methodology: a set of phases and steps that describe the execution of the framework; and
3. Enablers: techniques, tools or guidelines that help execute a specific step or a phase of the framework.

The selection process started with these criteria. In addition, the variety of academic fields and expertise were taken into account. The objective was to select frameworks that were “representative” of the field of study in the literature, and where the three elements were covered with enough details.

Three business transformation frameworks were selected that combine academic and professional backgrounds. The first is the Business Process Reengineering (BPR) methodology (Kettinger, Teng et Guha, 1997) which focuses on BPR approaches, but has a broader spectrum and could be analyzed in the context of business transformation. The second is the Lean transformation roadmap (Nightingale et Srinivasan, 2011). Lastly is the Business Transformation Management Methodology (BTM2) (Uhl et Gollenia, 2013). The last two frameworks were specifically designed for enterprise transformation. Section 5.4.1 describes each selected framework and their key characteristics.

The selected frameworks were then used to perform a comparative analysis. This resulted in a review of their similarities, differences and how they can complement each other. The comparison took first into account the requirements of the industrial partner’s team to evaluate the methodological structure of the frameworks (e.g. decomposition into phases and steps, the definition of success factors, the specification of key deliverables), and to summarize their differences into strengths versus weaknesses. Then, the comparative analysis included emergent dimensions from the literature review that will influence the adaptation of the framework to an organizational context (e.g. the scope and type of change that a framework supports, the authors’ research background). Business transformation is at the intersection of various disciplines (Rouse,

2005a). Similarly, business transformation frameworks are found to be greatly influenced by the authors' research background. Plus, frameworks are mostly based on case studies where business transformation can occur at various organizational levels. Therefore, the comparison of the selected frameworks was based on:

- Theoretical and practical background: elements from the authors theoretical positioning of the framework, or from the evidence provided (case studies, surveys, etc.).
- Business transformation scope: defined by frontier and extent of the change within the organization.
- Methodological structure: considers how the frameworks' authors structured the various phases, stages, steps, or focus areas.
- Strengths: specific elements in each framework that emerged as being distinctive and added to what the other frameworks cover.
- Weaknesses: specific elements in each framework that were lacking and considered important by other frameworks.

From a practical perspective, comparing these frameworks helps underline the importance of understanding the organizational context before choosing or adapting a business transformation framework. Leveraging the strengths of each framework and minimizing exposure to their weaknesses can help managers and decision makers make a guided choice to the right formula for their organization's reality. The results of the comparative analysis are presented in section 4-b.

After the two previous analyses of the selected frameworks, and of the industrial partner's organization, an adapted business transformation framework was built. It merged the selected frameworks by leveraging their strengths and best practices. Then, it took into consideration three main aspects of the industrial partner's context: culture and organizational structure; vocabulary and terminology; and organizational maturity in the different disciplines required to manage a business transformation. The design of the adapted framework was done in collaboration with members of the industrial partner's team. This allowed for active participation in the design, and facilitated a progressive validation of the framework components.

Afterwards, the adapted framework was presented to, and discussed with, directors and executives, within the industrial partner organization, with experience in change and business transformation

initiatives. All feedback was collected and compiled to identify additional requirements to restart the research process again, and that will allow refinements and improvements to the adapted framework, in its structure and level of precision and detail.

In section 5.5, the framework adaptation is detailed. For a complete validation of the framework, a follow up study of business transformations that used it in the organization would be required. However, the industrial partner's plans for such initiatives will stretch for few years, making such a validation unrealistic for this research collaboration timeline.

As mentioned in the introduction, the objective of this article is to build an adapted business transformation framework to the industry partner's context. With the review and comparison of frameworks in the literature, the research team chose to leverage existing frameworks rather than to design a new framework. The three selected frameworks were combined then adapted to the industrial partner's organizational reality. This article will present the key factors of the company's context that influenced the design for an adapted business transformation framework. It will discuss the key steps and results. The details of the designed framework will not be disclosed, as they reflect confidential information about the industrial partner. Nevertheless, the outputs provide insights for the research community on the challenges of adapting conceptual frameworks to an industrial reality.

5.3 Literature Review

5.3.1 Business transformation as a research discipline

Business transformation is a research subject situated at the intersection of various other disciplines (Rouse, 2005a; Uhl et Gollenia, 2013), principally organizational change, systems engineering and project management.

Organizational change literature views business transformation as a type of change characterized by a discontinuous rate of occurrence, a planned approach, and extended scale of change to cover several or all parts of an organization (Todnem, 2005). Some authors argue that change is an emergent phenomenon, and as such it should be considered a capability within any organization where the responsibility of transforming the organization is delegated to all levels of management (Burnes, 1996; Timothy Kotnour, Al-Haddad et Camci, 2015). Change can also be considered a

planned process, where management with a conscious decision will initiate and bring change to the organization (Bamford et Forrester, 2003). The literature presents a variety of organizational change approaches that have very little empirical evidence to their effectiveness to deliver the benefits targeted. Todnem (2005) states that there are contradictions and confusions between the academic and practice-based approaches, and argues that most of these approaches are based on unchallenged assumptions about the nature of change in organizations. The variety of approaches and practices is also confusing organizations on which are effective and to what extent (Nohria et Beer, 2000). Still, the theory on the nature of change is evolving (Bartunek et Woodman, 2015). New approaches are surfacing and arguing for inquiry-based and social methods of organizational change (Bushe et Marshak, 2009, 2014).

Researchers in systems engineering extended the holistic and integrative philosophy of this engineering field to tackle organizational issues (Rouse, 2006). Presenting the organization as a system of systems, referred to as enterprise (Rouse, 2005b), the application of system engineering approaches and tools introduced enterprise transformation research area. Within this body of literature, enterprise transformation is presented as a one-time endeavor, an initiative, a program or a project. As such, it is compared to other project managed changes, mainly Continuous Improvement (CI) and Business Process Reengineering (BPR). Each approach will have its own specific scope, level of risk and complexity, and different impacts on the organization (see comparison summary in Table 5-1).

Both in organizational change and systems engineering literature, project management is considered as an important discipline for the delivery of transformation. In project management literature, projects are perceived as the conveyor of change supporting organizations in delivering the change successfully (Gareis, 2010; McElroy, 1996; Yeo, 1996). As the scope of change and business transformation become larger, different projects will interact and require a level of cohesion in decision making ensuring delivery of the targeted benefits attained through programs structure and governance (Levene et Braganza, 1996). Program management emerges as a discipline helping the structuring and delivery of business transformations (Pellegrinelli et Murray-Webster, 2011; Subramanian, 2015)

Table 5-1. Comparison between Continuous Improvement, Business Process Reengineering, and Enterprise Transformation

Criteria	Continuous Improvement	Business Process Reengineering	Enterprise Transformation
Type of change	Incremental change : One step at a time	Radical but not disruptive	Radical and disruptive
Risk	Low risk initiatives	Medium risk initiatives	Very risky initiatives
Scope of work	Small initiatives focusing generally on one dimension of the organization	Medium size initiatives mainly centered on (but not limited to) process changes and often includes technology implementation	Large initiatives impacting all dimensions of the organization (people, processes, information and technology)
Complexity	Low complexity: mainly focused at the task level	Medium complexity: a process (supported by technology or not) will be the key conveyor of change	Very high complexity as substantial changes touch all dimensions of the organization and may reach its relationships (internal & external)
Impact on Organization	Very limited: mostly delivers value in a small group	Limited to the process and the technology involved in scope of the reengineering initiative	Substantial added value translated into fundamental changes in how work is done and how value is delivered.
Example of references	(Ishikawa, 1988), (Deming, 2000), (Womack et Jones, 2003), (Pyzdek, 2014)	(Hammer et Champy, 1994), (Davenport, 1992), (Grover et Malhotra, 1997), (Harmon, 2007)	(Rouse, 2005a), (Tim Kotnour, 2011), (Nightingale et Srinivasan, 2011), (Uhl et Gollenia, 2013)

Across the various disciplines in the literature, defining the scope of the business transformation is a common challenge. Depending on the nature of the change and the organization's boundaries, business transformation can occur at different levels. Purchase et al. (2011) indicate that the definition of the boundaries will define the level and reach of the required changes. Rouse (2005b) introduces a tool to assess the magnitude of the business transformation and helps understand its components. The levels of business transformation are expressed differently in enterprise transformation references. They are summarized in four levels, explained in Table 5-2.

Table 5-2. Levels of business transformation

Level	Description	Example
Level 1 Business unit	The enterprise is limited to one or interrelated business units in one company. Business units are functional groups or departments.	Changing the new product development process is a transformational initiative that touches different business units.
Level 2 Business Area	The enterprise is defined as one portion of the company's revenue stream (one division, group of products, etc.).	The acquisition of a company as a new division is a transformation. The newly acquired company may have to comply with the acquirer's culture, processes, etc.
Level 3 Company	The enterprise comprises the whole company with all its business units and business areas.	Implementing an Enterprise Resources Planning (ERP) system is an initiative that will transform the entire company.
Level 4 Supply chain	The boundaries are in their most inclusive form, including various companies tied by supply chain interrelations.	Adopting a new industry standard is a transformation of major components of the company. It goes beyond to influence its customers and suppliers.

Another common perspective on business transformation in the literature is the identification of success factors. As an example, having the highest level of sponsorship, and a top down leadership involvement, are presented as key factors for any successful change (Kotter, 1995). These factors are now considered guidelines that organizations should know and enact for any type and level of change. However, lessons learned from business transformation initiatives reveal that it is not necessarily trivial for organizations, and that highlighting it is still very relevant (McKinsey, 2008b). The study of business transformation success factors has revealed specific factors to this type of change approach (Govindarajan and Trimble, 2011; Kotnour, 2011; Rouse, 2005b, 2011; Uhl and Gollenia, 2013; Valerdi, Nightingale, and Blackburn, 2008). They are summarized into three groups (see Table 5-3):

- The team: people are the leaders and the subject of change. Building the appropriate team to lead and execute the business transformation is of the highest importance. A strong, committed and structured team will facilitate the next groups of success factors.
- The approach (or methodology): describes how the business transformation will be conducted from the idea to the implementation of required changes.

- Enablers: they are analytical (techniques and tools) and organizational (culture, maturity, etc.). They support both the team and the approach to delivering a successful business transformation.

Table 5-3. Key success factors of business transformation

Team	Approach	Enablers
• Sponsor at the highest level of the organization • Top down and involved Leadership • A well-defined and structured governance • A culture and practice of collaboration	• A holistic and integrative approach • Program and/or project managed • A focus on effectiveness before efficiency	• Assessment of an organization's maturity and readiness • Balance between soft and analytical aspects • Leveraging and integrating existing expertise and disciplines

5.3.2 Business transformation frameworks

In academic and professional literature, various structures are publicized as business transformation frameworks. However, not all of these structures can be used to initiate, plan and execute business transformations. Most structures are more assessment tools than frameworks. For example, the McKinsey 7S model was initially built to help organizations assess their effectiveness and provides directions to where changes are required (McKinsey, 2008a). A balanced scorecard is a strategic planning tool that focuses on the use and structure of metrics to drive results in the organization (Kaplan et Norton, 1992). Enterprise Architecture frameworks (EA) like TOGAF or Zachman, were developed to align IT architecture and capabilities to the organization's strategy and objectives (Donaldson, Blackburn, Blessner et Olson, 2015). These models and structures provide insightful perspectives and tools to analyze the organization. Nevertheless, they lack the full view of the organization's dimensions: strategy, people, processes, information and technology. They also lack the enactment of key success factors, specifically program and project management. Created for specific aspects of the organization's ecosystem, they are limited and do not provide guidance on how to deliver business transformations (Uhl et Gollenia, 2013).

Business transformation frameworks are found in two types of literature; practice-based and academic research. The practice based literature is mainly from consulting industry which distill their expertise into guidelines to perform business transformations (Bucy, Finlayson, Kelly et

Moye, 2016; Lars Fæste et Hemerling, 2016; Maceda, Garstka et Ormiston, 2014). These frameworks are descriptive. They emphasize why business transformation is a “necessity” for organizations. They outline key success factors or conceptualize an approach with minimal detail on how to conduct specific activities. The academic research literature has a wider perspective on business transformation frameworks. Depending on the field of study, researchers analyzed and structured business transformation with different lenses. In organizational change and change management literature, frameworks are mainly descriptive and focus on specific organizational issues such as leadership styles, culture change and roles of change agents (Appelbaum et al., 2012; Chapman, 2002; Timothy Kotnour et al., 2015; Kotter, 1995). In the management and strategy literature the discussion evolves around phases of business transformation, transition states, and tools to choose the appropriate type of business transformation approaches (Bjelland et Wood, 2008). The business process reengineering literature is rich with methodologies to perform business reengineering changes (Brian Harrison et Pratt, 1993; Furey, 1993; Kettinger et al., 1997; Muthu, Whitman et Cheraghi, 1999). Here the methodologies are prescriptive and some authors provide detailed steps and tools to perform such changes. In the enterprise transformation literature, frameworks refer to categorization tools that support the positioning of business transformation approaches and levels (Rouse, 2005a). Others are industry based. By examining specific contexts they define business transformation stages to support decision making (Basole, Braunstein et Rouse, 2012), or detail how a specific business transformation was conducted (Espinal, Clempner et Escobar, 2012).

In the various streams of business transformation literature, all related-topics have been covered and discussed. However, none of the references covers all topics (Slavin et Woodard, 2006). The myriad of methodologies, approaches and frameworks have various levels of details and contexts.

5.4 Frameworks Selection and Comparison

5.4.1 Selected Frameworks

The first selected framework is the Business Process Reengineering (BPR) Methodology presented by Kettinger et al. (1997). This work reviewed the literature about BPR and surveyed various consulting firms about their methodologies. The authors consider BPR as a form of organizational change that transforms interrelated systems to produce strategically valuable impacts. BPR uses

business processes as the main analytical dimension to perform business transformation. The authors' work resulted in a consolidated BPR methodology structured into 6 stages (S) and within each a sequence of activities (A) are defined. In their survey, the authors collected tools and techniques, and mapped them to the activities within each stage. The main strength of this work is the richness of its research input data that combines both academia and practice. Its main flaw is the sequential presentation of its stages and activities, which makes it a good fit to specific and limited business transformation initiatives (level 1 business unit), and less adapted to a larger scale business transformation.

The second framework in the selection is the Enterprise Transformation Roadmap. This framework was developed through 12 years of research within the Lean Advanced Initiative at MIT. In their work, Nightingale and Srinivasan (2010) adopt the lean thinking and value-driven philosophy and the systems engineering view on organization as enterprise (system of systems). Their methodology has 3 cycles within which steps and goals are defined. For each cycle, the authors display and explain key tools and techniques to execute the activities. The planning cycle of this framework was the most developed and detailed compared to the strategic cycle and execution cycle. Leveraging the strong analytical and integrative practice of systems engineering, the authors presented a multi-lense analytical approach to planning for a business transformation. This multi-lense analysis is the spearhead of the framework. At the same time, the focus of this analytical view created an imbalance with organizational and more people-oriented aspects, such as change management and communication.

The third framework is the Business Transformation Management Methodology (BTM2). Developed in collaboration with an information system company, this framework is structured with a descriptive format. The corner stone of the framework is the concept of meta-management, as defined by Uhl and Gollenia (2013, p.13) "Meta-management is business-driven, value-oriented, and integrates three pillars: management disciplines; transformation lifecycle; and leadership". The authors argue that organizations have existing management disciplines. Each discipline has its own assumptions and approaches. Meta-management allows the integration of these disciplines to align them towards a common vision, thus providing clarity and cohesion. The methodology is built into four phases where management disciplines will intervene in various intensities. The management disciplines are in 3 categories: meta-management, direction, and enablement. Similar to a capability model, the authors have presented the key activities that each discipline will perform

during a business transformation journey. BTM2 is presented as a holistic and integrative approach to business transformation that balances analytical and organizational management disciplines. Yet, the framework lacked specifics at some levels. Some areas were discussed on a conceptual level, which makes it less evident to apply by business transformation practitioners.

5.4.2 Comparative Analysis

Comparing the three selected frameworks (see Table 5-4) suggests that scientific and practical backgrounds influence the framework design. Both Business Process Reengineering (BPR) Methodology and Business Transformation Management Methodology (BTM2) share the information system background. And both frameworks leveraged collaborations with information systems companies and consultants. There is a close link between business transformations and the impacts of information technology (IT). Business transformations can include changes to IT systems However, not all business transformations are about IT changes. Also, IT projects can lead to some level of business transformation (e.g. process reengineering at a department level), but not all of them do so and are limited in their scope of change (e.g. information system version upgrade). A large number of information technology (IT) companies provide consulting services for their customers to support such changes, and most of them have their own methodologies for different levels of business transformation. Management consulting firms also offer specialized services to support business transformations. This indicates that the development of business transformation knowledge and practice is more dynamic in practice than it is in academia. Business transformation frameworks have been developed on a post factum base, and are publicized as being tested with practitioners or on real cases. No empirical evidence was found in the literature confirming the effectiveness of any of the frameworks selected. This is aligned with the (Todnem, 2005) argument about change approaches in general.

In all frameworks, there are frequent references to project or program management. The enterprise level transformation frameworks indicate close links to be established between the projects and an umbrella that guides and links them, called programs or a roadmap. This supports the importance of project and program management as a key success factor for business transformations.

Table 5-4. Comparative summary of business transformation frameworks

Criteria	Business Process Reengineering Methodology	Enterprise Transformation Roadmap	Business Transformation Management Methodology
Theoretical and Practical Background	Review of consultants' methods with influence of information systems and technology field	Based on research with manufacturing industries and the influence of a systems engineering field	Developed in collaboration with a major information systems and technology company
Transformation scope	Focus on specific and scoped projects (lower levels of transformation)	Designed for enterprise transformations (higher levels of transformation)	Designed for enterprise transformations (higher levels of transformation)
Methodological structure	Built into stages and activities	Composed of cycles, steps and goals	Built around phases of transformation with guidelines for work streams
Strengths	• Strong methodology for the lower levels of transformation • Extensive list of supporting techniques and tools • Contingency approach for context adaptation	• Adapted to higher levels of transformation • Holistic and structured cycle and steps approach • Detailed Planning Cycle (steps, techniques and new tools like ESAT and LSAT)	• Adapted to higher levels of transformation • Holistic and Integrative approach (management disciplines) • Balance between analytical and organizational aspects • Focus on governance and cultural aspects
Weaknesses	• Limited to a process scope (not adapted to high level enterprise of transformation) • Influence of IT practices • No specific guidelines on selection of tools and techniques or best fit for situations.	• Little focus on soft organizational characteristics (culture, human behavior, etc.) • Too much focus of the analytical approach and tools. • Applications mostly in complex manufacturing organizations	• Very little guidelines about tools and techniques to use • Lacks specifics on how to adapt to an organizational context (vague guidelines) • Provides case studies in different industries but still lacks empirical evidence.

5.5 Framework Adaptation

The industrial partner is a public, North American company. It has a market capitalization of more than 30 billion U.S. dollars, and employs more than 20 thousand people. This company is one of the leaders in its industry. The research team worked closely with various levels of the organization ranging from project managers to senior directors and vice presidents. The main contact was an internal consulting team that focuses on reengineering and transformational projects and works with all departments in the company. A member of the research team worked closely with the internal consulting team to understand the company's history, context, strategy and values. The research team also met for formal and informal interviews with different employees, especially experienced staff that lived through business transformations within the company or in other work experiences. The role of researchers was not to help the company deliver a business transformation.

Rather, their key contribution to the organization was to deliver a framework for business transformation that will satisfy the following requirements:

- Sponsorship and leadership: understand the roles and positions of required sponsors and leaders for a business transformation;
- Governance: define a governance model to manage business transformations where roles and responsibilities are clearly defined;
- Methodology: outline a clear and structured methodology to start and deliver business transformations. A good level of detail is required for the methodology that provides concrete steps, goals, techniques and tools;
- Actionable: the framework should be actionable, in the sense that business transformation leaders within the organization should be able to use it right away; and
- Adapted: the framework should consider the company's particularities surrounding context and culture.

For better design and adaptation of the business transformation framework, an understanding of factors that will influence the adoption of any framework within the company is required. The research partnering company is an operations-centric organization where efficiency is extremely valued. It has a command and control culture, especially in operation groups. The most effective way to influence the decision-making within it would be with a top-down approach, where top executives and leaders will represent the first focus point. Previous project experiences reveal that the company decision makers value more formal and sequential planning, especially for large and risky projects with cross-functional teams. The research team's interpretation of the business context is that the company is under no imminent danger or challenge requiring immediate change. The leadership team considers business transformation as an approach to enact a strategic agenda to sustain growth and consolidate an industry-leading position. There is also a recognition that with the changing economic and technological environment, important changes will soon come and that the company should be prepared to lead through them. On the other hand, the company's management has diversified backgrounds. Most of the top leaders come from the company's ranks and with a lot of experience in the industry. Others come from other industries, and with different management styles. This creates some differences in the approach to transforming the company. An indicator to those differences lies in the vocabulary and terms used. Some terms had specific

connotations within the organization. For example, the use of the term “phase” had a bad connotation, as previous project experiences with phases were not very successful. Another would be the term roadmap, which refers to a more technical information architecture concept within the company. Thus, the choice of the vocabulary is a determinant factor to the framework acceptance in the organization. In addition, the company developed key transformational management competencies in a decentralized and reactive mode. For example, several Project Management Offices exist within the company, scattered throughout different business units. Also, change management expertise has long been focused on information technology projects and changes.

The general structure of the adapted framework is composed of principles, methodology, organizational enablers, and analytical enablers (see Figure 5-2).

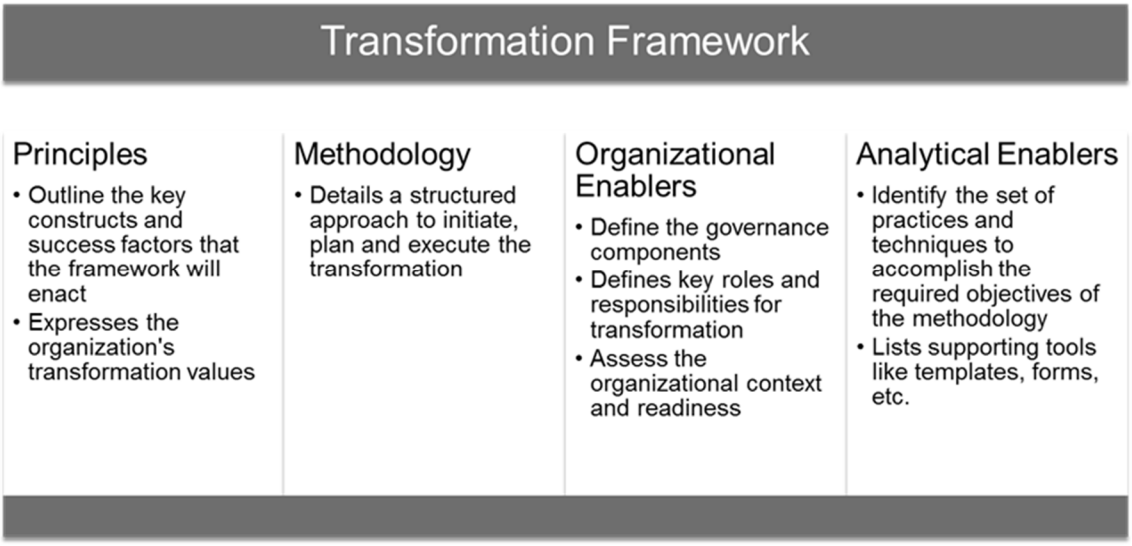

Figure 5-2. Structure of adapted business transformation framework

First, the research team started with identifying which success factors would be relevant and important for the company to internalize for successful business transformations (see Table 5-5). Aligned with the adopted definition of a framework, success factors were expressed as principles. The main influencing factor was the company’s culture. One of the company’s core values is people as its main asset. This value was leveraged to express principles about sponsorship, leadership and governance. They were first presented as components of “the transformation team”. Then came principles around the transformational approach; holistic and integrative. Because of the current decentralized reality of the business transformation management competencies, the approach

characteristics were second in priority to present and emphasize. The third group of principles described key practices and ideas supporting the approach. The most important for the industrial partner was the focus on effectiveness before efficiency: when transforming, the priority should be on delivering the right objectives, then focusing on efficient ways to do it. With the current efficiency culture in the company, this principle was the most important to communicate and clarify.

Table 5-5. Principles of adapted business transformation framework

Transformation Principles
• Has a Sponsorship that is at the appropriate level of the organization (the highest and right level). • Ensures a committed and involved leadership (top down, at all levels). • Leverages a strong governance that provides discipline and integration between phases, practices, functions, and people. • Uses a holistic approach that comprehends all the elements of the organization's value chain. It also focuses on internal and external interdependencies. • Aligns with the organization's strategy and stakeholders (customers, regulators, external partners, or other business areas, business units, or groups within the organization). • Puts effectiveness (getting the right objectives) before efficiency (executing with least cost): aims to deliver the value proposition before executing at a lower cost. Profitability will be incremental. Execution may not be optimal at the start. Changes must be sustained and nourished through organizational learning. • Balances analytical (rational) and soft (culture, skills, values, etc.) aspects. • Assesses initial organization's capacity, ability and risks to deliver transformation. Timing is studied and mitigation plans are laid out to ensure the organization's readiness for the changes.

Afterwards, a methodology for business transformation was drafted. It is structured in 4 cycles and 16 steps (see Figure 5-3). The methodology picks the strengths of the three frameworks reviewed. From the Business Process Reengineering Methodology, it takes the highly structured presentation in stages and activities. This was aligned with the industrial partner's need for a structured methodology and not only guidelines. From Enterprise Transformation Roadmap, it exploited the idea of cycles that underlines a grouping of activities and the feedback loops required. Even though, the framework is presented in a linear format, the use of cycles emphasizes the iterative nature of going through the activities within each. From Business Transformation Management Methodology, it leveraged the meta-management approach to integrate required disciplines. The drafted methodology takes a transformation idea from its inception, through engaging the right stakeholders and leaders, and thorough planning and design, to have a controlled and measured execution. Previous projects' structures in the organization helped shape the methodology. As the

most successful projects had very directive and prescriptive methodologies, detailing steps was required above identifying key deliverables for each cycle.

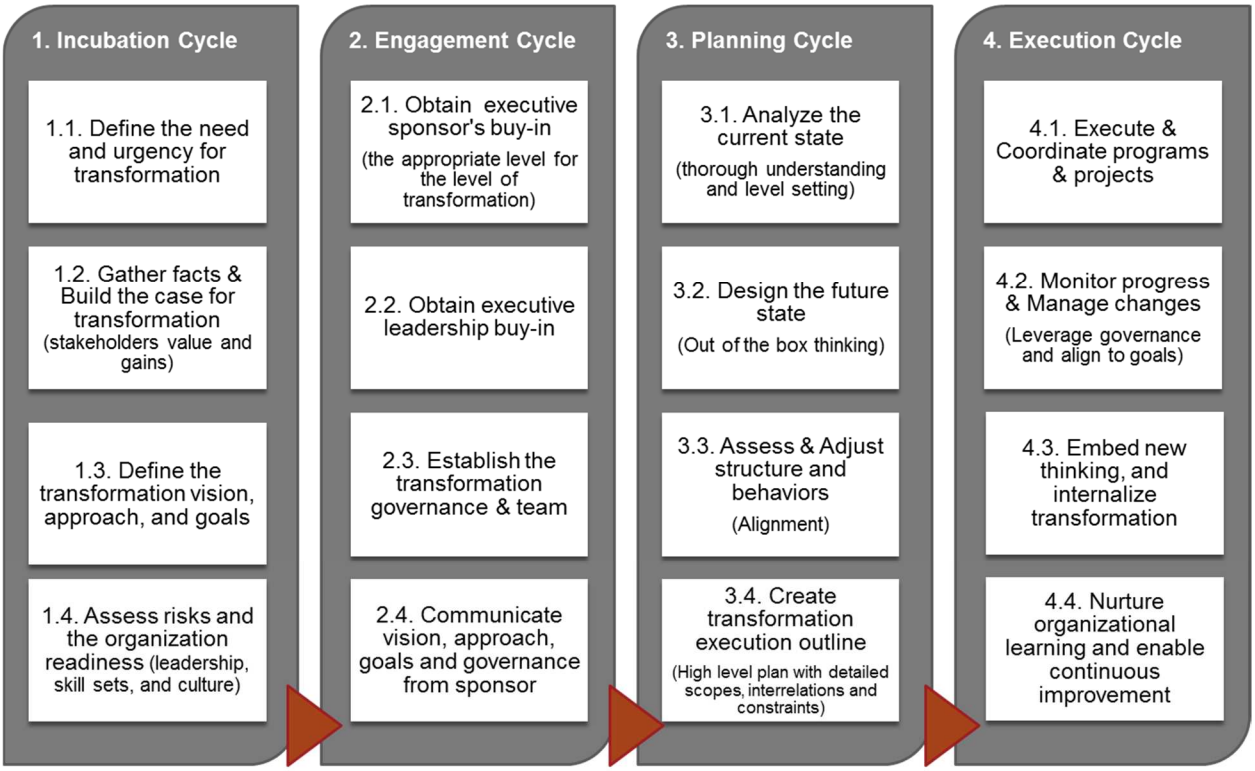

Figure 5-3. Outline of adapted business transformation framework methodology

From all three frameworks, tools and techniques were linked to the adapted methodology steps. The resulting mapping of tools and techniques to activities is similar to what Kettinger et al (1997) presented. This was required to complement the details of the methodology steps. Table 5-6 provides some examples of steps in the methodology with detailed objectives and mapped tools, techniques and skills required.

The company's Information and Technology (IT) department is using and promoting PRINCE2 methodology to manage projects within the organization. The frameworks governance model was built on the governance model already adopted by the IT department from PRINCE2. Plus, a three levels governance was included: transformation, programs and projects, which is closer to the model of Business Transformation Management Methodology. The governance model reflects the company's decision-making mechanisms. It also uses vocabulary adapted to the organization, especially when it comes to expressing roles and responsibilities (see Figure 5-4).

Table 5-6. Examples of objectives, tools and techniques mapped to the adapted framework steps

Step	Objectives	Toolkit (Skills, Techniques & Tools)
1.2. Gather facts & Build the case for transformation	• Gather data and facts relevant to the transformation need (sales, claims, operational measures, financials, etc.) • Analyze and aggregate data and facts to support transformation arguments (presentable) • Understand the transformation business case audience (Who? Expectations ? Questions ?) • Build the transformation business case (the transformation need, data and facts, argument, urgency)	- Strategic Analysis (Porter Five Forces, SWOT, McKinsey 7S Model) - Interviews; Delphi technique; Brainstorming - Data Analysis - Stakeholder Value Analysis - Audience Analysis - Business Case Building; Cost benefits analysis; - Presentation Skills - Persuasion Skills
1.4. Assess risks and the organization's readiness (leadership, skill sets, and culture)	• Assess the risks of business transformation on the company (current business model, customers, operations, finances, people, etc.) • Assess the company's readiness to transform (leadership style, management style, people's skills, culture) • Build a mitigation plan to risks and organizational readiness to support the transformation approach	- Risk Analysis and Assessment - Organizational Assessment - Risk mitigation planning - Change Management - Interviews; Focus Group; Surveys - Maturity Assessment Models (CMMI)
2.3. Establish the transformation governance & team	• Define and assign steering committee roles and responsibilities (see governance details) • Identify the skills and expertise required for the transformation team • Define and assign the transformation team roles and responsibilities • Organize transformation team kick-off meeting (communicate, clarify, engage) • Organize steering committee kick-off meeting (communicate, clarify, validate and engage)	- RACI Chart - Presentation Skills - Persuasion - Interviews - Negotiation skills - Political Acumen

Table 5-6. Examples of objectives, tools and techniques mapped to the adapted framework steps (Cont'd and end)

3.1. Analyze the current state (thorough understanding and level setting)	• Define current state analysis scope and objectives • Identify and engage required SMEs to support the analysis • Perform stakeholders analysis • Perform value analysis (business model review) • Analyze processes architecture (focus on interactions) • Evaluate the resources allocation (human, financial, and material) • Review and complete the organizational assessment by a maturity evaluation (for change readiness, skills, leadership styles, management mindset, training, application of practices, etc.) • Measure current state dimensions and define baseline performance • Identify pain points, challenges and opportunities • Validate current state diagnosis understanding, by the transformation team, by SMEs, and by the steering committee	- Strategic Analysis (Porter Five Forces, SWOT, McKinsey 7S Model; Force Field Analysis) - Interviews - Data Analysis - Stakeholder Analysis - Benchmarking - Business Model Generation; Lean Startup approach; MARS business model for startups - LESAT (Lean Enterprise Self-Assessment Tool); any specific self assessment of maturity tool for the area of analysis - APQC Process Framework; Architecture Capability model; SCOR Model; - Business Process Reengineering; Business Process Maturity Model; Business Process Library - Balanced Scorecard - Brainstorming; Focus Groups; Delphi Method; Facilitation

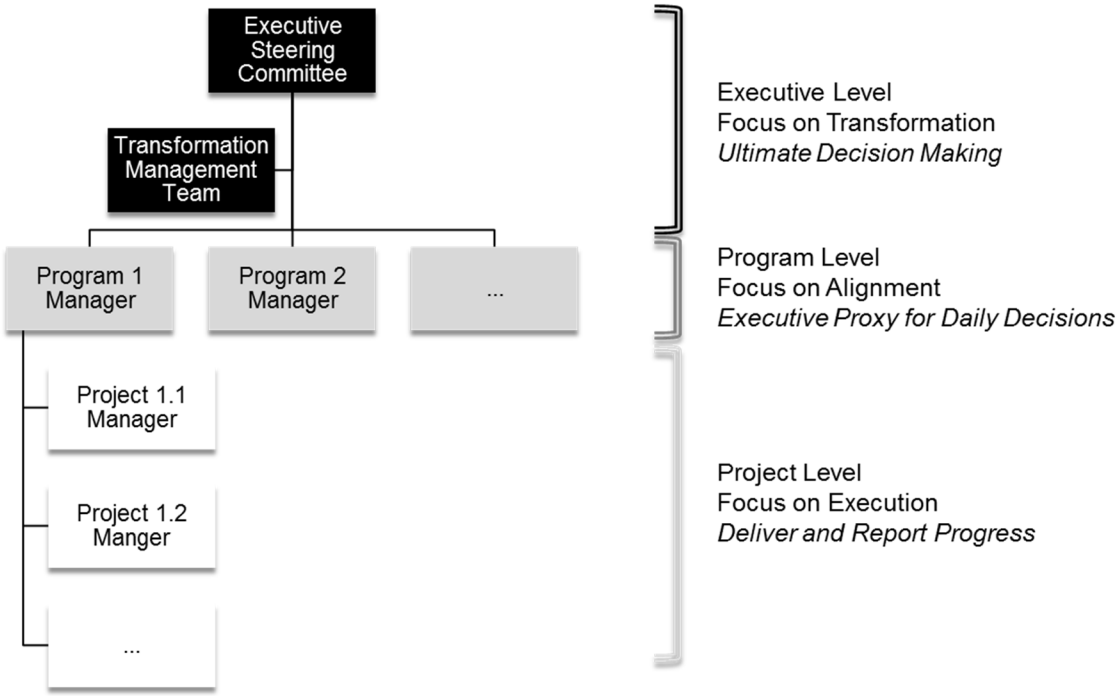

Figure 5-4. Governance structure of adapted business transformation framework

Discussions and interviews with the industrial partner's team revealed that the company already has, and applies, various practices relevant to managing a business transformation. For example, a dedicated team of change management specialists exists and supports mainly information technology projects. As such, the required management disciplines to manage a business transformation initiative are mostly existent in the company. However, it is recognized that the challenge is in the ability to integrate their efforts and expertise towards a unified vision and within a business transformation initiative. In the literature, there is the concept of leveraging internal expertise to maximize engagement and focus on the business transformation objectives. The adapted framework relies on 12 management disciplines relevant to the organization (see Figure 5-5):

- Transformation Execution Plan, and Program and Project Management are disciplines aiming to ensure the integration of the disciplines and aligning their efforts and plans towards the common objective of the business transformation.
- Strategy Management is concerned with defining the business drivers, business model and business competitive advantages. It looks at aligning the business transformation with the organization's vision and strategy.
- Value and Stakeholders Management extends the concept of value from the customer to all relevant stakeholders of the organization. Consequently, it assesses the stakeholders' expectations and how the organization should create and deliver value to satisfy its stakeholders.
- Process Architecture aims at understanding the organization processes at the appropriate level for the business transformation context. The focus is on processes interactions and value creation.
- Resources Management analyzes the resources (human, financial, and material) allocations in the organization and aims to optimize their use to enable the organization's vision and objectives
- Change Management stands out from other practices by its particular consideration to the interrelation between culture, governance, human behavior and the benefits of the business transformation. It assess the readiness of the employees to take in a change and defines the appropriate approach to make the change happen and sustained.

- Risk and Maturity Management defines how the various types of risks (reputation, financial, etc.) will be identified and managed throughout the business transformation journey. A maturity assessment helps define focus areas to prioritize and supports the tracking of the changes' effectiveness.

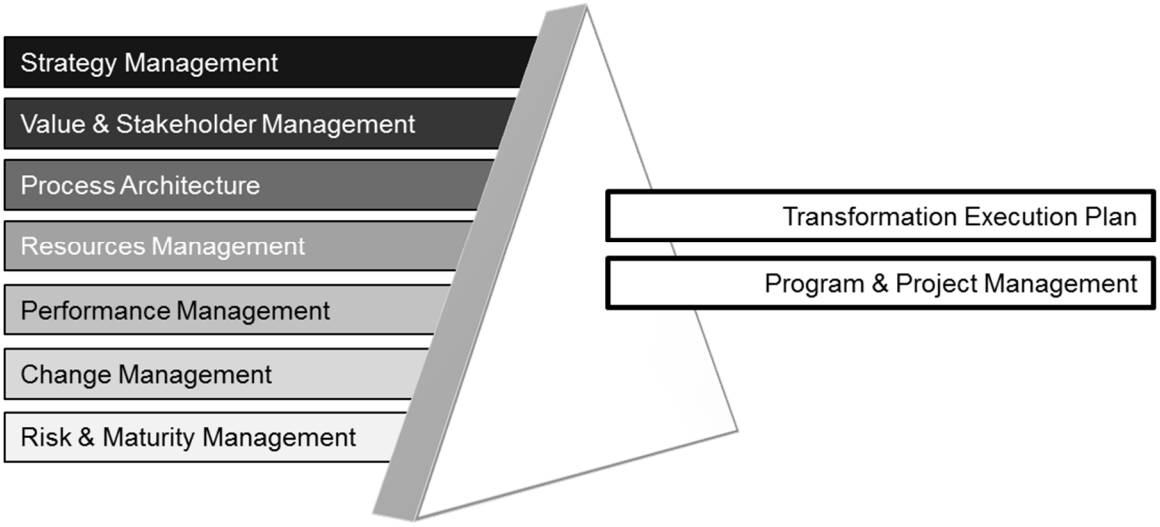

Figure 5-5. Analytical enablers outline of adapted business transformation framework

Through a series of presentations, the framework was validated with senior managers and directors. As the different components of the framework were developed in tandem with the internal consultant team, and other participants from the company, the validation sessions derived feedback. The adapted framework was consequently adjusted. Adjustments were both on the content and the format of the framework. Some directors have led business transformations within the organization in the past. They remarked that because the company is execution-centric, the execution phases in projects and programs tend to be the least documented. And a walk through the framework allowed to capture additional details in the execution cycle of the methodology. In addition, all participants provided insights on how the framework should be presented in its format. Options of presenting the methodology in a cyclical format were excluded. Most participants thought it more important to outline the steps clearly, which the retained format of the methodology provided.

The adapted framework was the result of the combination of the three analytical components performed: 1) Review business transformation success factors; 2) Comparison of business transformation frameworks; and 3) Analysis of the industrial partner's context. When designing the framework, the choices were driven by the results of the analysis, and by the degree of fitness

with the company's context. Discussions with the industrial partner's representatives revealed counter-intuitive choices in the development of the framework. Most of these were related to the decision making model within the organization. The level of empowerment of mid-level management is relatively low. And the optimal direction would have been to develop the maturity of the organization on this element. However, the industrial partner's representatives argued that such a change would be too long to instore. This is an example of the challenges the research team faced understanding the industrial context and relating it appropriately to the knowledge documented in academia and practice. One of the most challenging aspects was the discussions about the terminologies and vocabulary. It proved that the gap between practice and theory is not only in the application of ideas and approaches, but also in the terminology used.

Even though the adapted framework will benefit the industrial partner, the addition to the research literature would be limited. The details of the adapted framework will be only relevant for the industrial partner, as they were tailored to its context and organizational characteristics. The adaptation efforts that were undertaken served as a validation step in the exploratory and analytical research approach. It helped to refine the research team's questions about the existing frameworks.

5.6 Discussion

In this article, the analysis focused on the three frameworks selected. A visible trend is the influence of the authors' research backgrounds on the level of detail and focus they use in their frameworks. Similar trends were found in the other approaches not selected for this analysis. For example, Subramanian (2015) leverages program management as the key discipline to perform business transformations. Business transformation frameworks are designed on a post factum basis. The frameworks refer to pre-existing business transformation cases, from which practices and methodological components were derived. The variety between the business transformation frameworks may be explained by the uniqueness of each case or the cases they rely on, and the angle of the analysis undertaken by the research teams. It is aligned with change management frameworks in general and their lack of quantitative supporting data (Todnem, 2005). The core characteristics of business transformations are the radical and risky types of change for the organization. The nature of change is still a subject of much debate. The conduct of change in organization relies on past experiences and success cases. In the three selected frameworks analyzed, different aspects of complementarity were found; the level of detail, the structuredness

of the methodology, and the balance between analytical and organizational aspects. This complementarity represents a source of richness that was leveraged in collaboration with an industrial partner to design an adapted business transformation framework to its reality.

This article's comparative analysis underlines the differences between existing frameworks. It questioned the use and adaptability of such frameworks to perform business transformations in specific contexts. The challenges faced in adapting a framework to the industrial partner's context reveal the lack of specificities in some of the frameworks. Thus, the main contribution is of a methodological nature. The research approach of both exploring existing literature and analyzing an industrial context provides some guidelines on how to adapt a "generic" framework to a specific organizational situation. Table 5-7 provides a summary of some guidelines that were the most pertinent for this research.

One may argue that such efforts are limited and the results cannot be extended. This represents one of the limitations of this research. The collaboration with an industrial partner provided the advantage of access to an organizational context intimately. And it has the limitation of being singular. It is an opportunity for future research to extend this approach to other organizational contexts, and improve it by integrating other research methods such as the validation of observations through a structured survey. That being said, it is important to point out that this access to an organizational context for such a sensitive and strategic subject is important for the research community. It allows the grounding of some of the assumptions about an organization and the nature of changes within it. The absence of quantitative studies about the success of the proposed frameworks stresses the necessity of more industry-academia collaborations to reveal any existing gaps. This is especially crucial when most of the published business transformation frameworks claim to have an appropriate approach for success. Which one is right? In this work, it is argued that contextual studies with specific organizational situations are necessary to choose the best fit. Hence, no framework is optimal on its own.

Table 5-7. Summary of business transformation framework adaptation guidelines

Step	Description	Impact on framework
Develop an intimate knowledge of the organizational context	The focus is to collect information and understand deeply the organizational context by studying key elements like: - The industry: the company's position and value offerings - The company's strategy: vision and objectives that outline what is important for the leadership of the company - The organizational culture: understand how change is perceived, and how employees are best influenced - The internal organizational relationships and dynamics: understand how decisions are made	This knowledge will help shape the business transformation framework by adjusting components like: - Adopting a prescriptive or descriptive framework - Structuring the governance model to reflect efficient decision making
Evaluate the organizational readiness for business transformation	The objective is to evaluate if the key transformational skills and competencies are present in the organization and what is their level or maturity, for example: - Leadership : who are the influencers in the organization? What type of leadership is predominant? - Communication : what is the most efficient channels to communicate in the organization? What should be avoided (vocabulary, etc.)? - Program and project management: What project delivery methodology is adopted? Who are the project managers?	This helps adapt: - Success factors (principles): put forward the most impactful success factors for the situation - Identify critical competencies and management disciplines to make visible and emphasize on
Collect and define requirements for business transformation framework	Gather the organization's specific requirements from a framework. It may include items like: - What do leaders need to influence the teams - What are the critical practices and principles that will make a difference in this specific context? Not all success factors will have the same level of impact in all contexts. Some will have a more predominant influence on the organization especially if it is less mature. - What levels of details is required? steps, procedures, techniques and tools, etc.	These requirements are useful to: - Success factors (principles): put forward the most impactful success factors for the situation - Develop the methodology within the framework - Assess the level of details required to describe the framework elements: steps, governance, etc.

In this article, the framework adaptation relied on the study of organizational characteristics; the organizational structure (roles and responsibilities), the culture, the leadership and management style, the core values of the organization, the decision making process, and the history of change within. Other organizational characteristics, that may influence the adaptation of a framework, were not considered, such as the internal power dynamics, and the external influence of industry and competitors. Further research on these characteristics will add to the validity and clarity of the adaptation guidelines. To support organizations tailor business transformation frameworks to their context, a more comprehensive investigation of organizational characteristics and how they influence the adaptation of a framework is required. In addition, business transformation relies heavily on the integration of management disciplines and practices (Uhl et Gollenia, 2013). The level of integration of these practices within the existing frameworks requires further research. In the case of project and program management practices; if business transformations should be managed as projects or programs, how well is project or program management integrated in existing frameworks?

As organizational pressure rises to start execution sooner rather than later, taking time and perspective to evaluate organizational characteristics to shape an adequate approach, will be challenged. Practitioners will face the dilemma of avoiding the action imperative, and taking the time to evaluate as many relevant frameworks as possible when choosing or adapting to their specific contexts. It would translate into more effort in the conceptualization and planning of business transformation approaches.

5.7 Conclusion

Business transformation can occur at various organizational levels, where the scope of the change is defined by the organization’s boundaries. Business transformation shares success factors with other change approaches regarding sponsorship, leadership, communication and governance. It also has additional success factors related to its approach and its enablers, both analytical and organizational. The comparative analysis of three selected frameworks of business transformation indicates that they are influenced by the author’s background and assumptions about the nature of business transformation and how it should be conducted in complex and uncertain environments. It also reveals that frameworks complete each other on the level of detail and guidelines they provide. From a practical perspective, these efforts to combine and adapt a business transformation

framework to an organizational case divulge the challenges of using such frameworks. How business transformation should be structured and planned will be influenced by the understanding of the specific organizational context. This study's approach to developing and adapting a business transformation framework to an industrial partner's situation provides some guidelines on how to perform such a work. It also indicates some of the organizational characteristics that influence the choice and adaptation of a framework within an organization. For future research, this article's conclusions should be tested against a wider review of business transformation frameworks. A wider review of other organizational contexts will help identify other relevant adaptation criteria. All of which should translate to improved conceptualization and planning tools for business transformation practitioners.

CHAPITRE 6 ARTICLE 2: ANALYSIS OF PLANNING PROCESSES IN BUSINESS TRANSFORMATION PROJECTS

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Abstract

This study aims to examine the characteristics of project planning processes and practices in the context of business transformation. It uses a qualitative multiple case studies approach to explore how business transformations are planned in a specific organizational context. It analyzes planning leveraging a process, people, and technology framework. The results outline the variety of planning processes and practices across cases. Planning has different definitions and scopes and the level of standardization is low. A strong project governance and leadership skills arise as enablers of effective planning. Also, results highlight the small amount of planning artefacts and deliverables used in this study's context, compared to project management standards. The article argues in favour of an adaptation of existing planning practices and processes for business transformation contexts. It contributes to a stream in the literature discussing project management practices adaptation to specific projects categories and contexts.

Keywords: Project Management; Planning; Process Analysis; Business Transformation

6.1 Introduction

Business transformation is a change approach where both the level of radicalness of changes and the expected value of results are high. It may then impact various dimensions of the organization; strategy, people, processes, information, and technology (Subramanian, 2015). It aims to bring substantial added value translated into fundamental remodelling to how work is done and how value is delivered. Its scope involves complex and interrelated aspects of organizations, such as multiple internal and external stakeholders. It adopts a holistic view of the organization and integrates multiple management disciplines to harness the complexities and risks of such radical change (Purchase et al., 2011). As such, business transformation can have a critical impact on organizations' performance and even their survival in their markets. Meanwhile, it has been proven difficult for organizations to plan and execute business transformations successfully, as the failure rate would range from 40 to 70 per cent (McKinsey, 2008b; Nohria et Beer, 2000).

Considering the major challenges that these projects represent, one could view program and project management as key disciplines for the success of such initiatives (Uhl et Gollenia, 2013). This points to a need to look closer in how business transformations are managed as projects or programs in organizations. More specifically, it is suggested that planning processes would be worth a careful

examination, due to their importance in determining project success (Dov Dvir, 2005; Serrador, 2013; Wang et Gibson, 2010).

Project planning has been extensively discussed in the literature. It is generally studied as specific techniques (Pellerin et Perrier, 2018), and is rarely analyzed as a process with an attention to its activities, decisions, inputs, and outputs, specifically taking into account the particularities of different application contexts. Indeed, the literature stream argues that project management practices should be tailored to the specificities of projects and their contexts (Besner et Hobbs, 2013; Niknazar et Bourgault, 2017). In that regard, Archibald (2013) identifies projects categories sharing similar characteristics where “Business and organization change projects” would be considered as one among many.

This study explores the planning processes in the context of business transformation projects. Using a multiple case studies approach, this article investigates current planning practices in a specific organizational context. This study is of exploratory nature with the objective to develop a deeper understanding on how project planning is performed for business transformations and to assess to what extent existing project planning practices are adapted to such projects’ context.

The remainder of this article starts with a review of project planning literature to summarize research trends on the subject. It is followed by a description of the research methodology including an overview of the data sets gathered for this research and the description of the case study approach. Then, the analysis of planning practices will be presented following a people, process, and technology framework including considerations of organizational context’s influence. The article concludes with a discussion of the results in relation to existing literature.

6.2 Literature Review

6.2.1 Project Planning

Planning is a management practice that helps reduce uncertainty and manage risks (Christensen, 1985). Its definition, approaches, and tools vary between application areas (Allmendinger et Tewdwr-Jones, 2002; Davis et Kahan, 2007; Pinedo, 2009). It is also seen as a central project management discipline (Dov Dvir, Raz, et al., 2003).

In project management guides and references, planning has the lion share of the content (Office Of Government Commerce, 2009; Project Management Institute, 2017). It is both defined as a phase of the project lifecycle (Pinto et Prescott, 1988; Serrador, 2015) and as a process or a group of processes (Office Of Government Commerce, 2009; Project Management Institute, 2017). Some authors would also view project planning as a decision-making process that structures information and defines actions to achieve project goals (Meredith et Mantel, 2009; Tallgren, 2018).

Despite variations in project planning definitions (Serrador, 2015), there is a consensus in the literature about its positive impact on projects' success (D Dvir et al., 1998; Dov Dvir, Raz, et al., 2003). Across different projects' contexts and industries, planning is confirmed as a key success factor (Serrador, 2013). Its benefits include reducing uncertainty and risks, improving the project delivery efficiency, and providing a baseline for monitoring and control (Kerzner, 2013).

The literature has addressed project planning with multiple views. It has a noticeable abundance of studies on specific planning activities or techniques like scheduling and sequencing (Khamooshi, 1996; Knotts, Dror et Hartman, 2000; Mummolo, 1994; Pellerin et Perrier, 2018). This may be attributed to the historical evolution of project planning that started with specific techniques like Critical Path (Kelley et Walker, 1959). Planning has also been discussed in relations to project management approaches. For instance, adopting a traditional or agile model will influence how planning is performed (Fernandez et Fernandez, 2008; Leybourne, 2009; Wysocki, 2009). Changing planning approaches is also influenced by the project's environment (Nuti, 1983). In dynamic environments, different planning approaches can be leveraged to reduce risks and help manage uncertainty (Collyer, Warren, Hemsley et Stevens, 2010; Collyer et Warren, 2009). In addition, the decision-making nature of planning has been emphasized (Shapira, Laufer et J Shenhar, 1994; Velayudhan et Thomas, 2018).

However, research on project planning as a process has been less abundant. In project management references like the PMBOK (Project Management Institute, 2017) the key activities of planning are identified along with the inputs and outputs expected and the processes are usually represented at a high level. Few studies have attempted to understand how organizations execute project planning processes (Serrador, 2015; O Zwikael et Globerson, 2004). These efforts focused on project planning details leveraging descriptive approaches, through multiple case studies (Alexander Laufer, 1992) or a single case study (Andersson et Johansson, 1996). They point to the

complex nature of project planning as a decision-making process and in relation to environmental factors and constraints (Winch et Kelsey, 2005). The development of project planning practices and tools requires first a deep review of their current situation in practice and in relation to the roles that are involved (Kelsey, Winch et Penn, 2001). That being said, these few studies were all conducted for construction projects.

In fact, project management as a field of study has long been associated with certain “hard” contexts such as capital projects. Serrador (2015) indicates that two industries have a more extensive body of research on planning than others: construction and information technology. In the same study, the author compared the variations of planning practices and concluded that: “planning requirements vary between companies, from project to project, and that different industries require different planning and planning tools”. Consequently, planning practitioners are compelled to adapt methodologies and tools to their projects’ specific context (Alexander Laufer, Tucker, Shapira et Shenhar, 1994).

6.2.2 Projects Contextualization

The Oxford dictionary defines context as: “The circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood”. A project context can then be defined as the set of circumstances and environmental factors that allows a full understanding of its specificities. The project’s context influences the practices of project management (Besner et Hobbs, 2013). The impact of some contextual factors has been investigated such as the organizational or institutional context (Klimkeit, 2013; P. W. G. Morris et Geraldi, 2011) and the national culture of the country or region where the project takes place (Rees-Caldwell et Pinnington, 2013; Rodrigues et al., 2014).

Because it is too complex to identify all contextual factors and include them in defining project management practices (Besner et Hobbs, 2013), categorization is proposed as a potential solution to help tailor project management practices. Leveraging projects categorization will help develop further theories for project management (Niknazar et Bourgault, 2017; Svejvig et Andersen, 2015). Different projects categorizations have been proposed (Archibald, 2013; Youker, 1999) relying on criteria like industry, project sizes, project lifecycle, and project end-product. An argument can even be made for organization-specific project management practices (Shenhar et al., 2005).

In short, research on projects contextualization and categorization point to the need to develop and adapt project management as a theory and as practices to projects' specificities and environmental characteristics.

The management of business transformation projects is highly dependable on the organizational context in terms of work culture and strategic agenda (Bjelland et Wood, 2008). The nature of such projects calls for even more adaptation of project management theories and practices. In a recent study Cha et al. (2018) reveal the limitations of current project management bodies of knowledge in supporting business transformations in delivering their intended benefits. All of which emphasizes the need to explore how project management practices can be adapted for business transformation. Especially as such projects are increasingly visible with important organizational and economic impacts.

In summary, planning has diverse definitions depending on industries and projects. Nonetheless, the literature converges on the importance of planning to projects' success. Project planning research is in majority directed to specific activities and techniques. Few studies have explored planning as a process. In addition, project planning research has long focused on capital projects in specific industries, mostly in contexts of construction and information technology. The literature also argues in favour of project management practices adaptation, like using project categorization. Particularly for business transformation, there is a need for a review of project management practices, especially planning. This study aims to contribute to the literature by exploring the characteristics of planning processes for business transformation projects.

6.3 Research Methodology

6.3.1 Multiple case study approach

The study is exploratory with the intent to understand the various intricacies of the planning process used in business transformation projects. In such exploratory research targeting the discovery of how a concept is manifested in practice, a case study approach is suited (Yin, 2014). As a research approach, case study allows the capture of events and flow of activities in organizations (Noor, 2008).

Business transformation is often considered a sensitive subject within organizations because of the strategic information involved. To get access to confidential data, a research partnership was developed with a company willing to share such information and where multiple cases of business transformations can be found. Once an industrial partnership was established, an embedded multiple case study was used (Noor, 2008; Yin, 2014). Such an approach provides an in-depth understanding of how a phenomenon takes place in the organization by comparing multiple cases.

Four business transformation initiatives were selected with the help of an internal team within the industrial partner's organization. The selection targeted initiatives where the change was considered relatively important and radical for the organization, and where the scopes and delivery methods provide a representative variety. Data availability was also considered as a selection criterion. The number of cases was minimized in favour of better access to data and to employees who participated in the selected initiatives.

The data collection revolved around in-depth interviews with participants in each case. This initial set of data was then complemented by a selection of documentation available for each case. To support the understanding and interpretation of the data, some general organizational context documentation was gathered. The selected cases and the collected data are summarized in Table 6-1. The overall data collection was spread from October 2015 until June 2016 and the cases covered a period of six years from 2010 until 2016.

A thematic data analysis approach was selected to codify qualitative data and groups it into themes (V. Braun et Clarke, 2006). Nvivo 12 was used as a qualitative data analysis software to support the collection, structure, coding, and analysis of the different data sources (Bazeley et Jackson, 2013).

Combining both a thematic analysis and data review, process maps were drawn for planning processes for each case. Comparing these maps, a general process was identified with shared steps and elements. Each case was analyzed separately using themes to identify planning components, roles, enablers, and challenges. Afterwards, a cross-case analysis was performed to compare these elements and identify shared observations and results (Eisenhardt, 1989; Krippendorff, 2004; Yin, 2014). To summarize each case, a report was built to group all relevant analysis items and structure it as a case study format. The cross-case report was built to link all four cases and provide additional insights using the general context information.

6.3.2 Organizational Context

The industrial partner is a North American public company with a capitalization of about 40 billion US dollars. Operating in the industry of transportation and logistics, it has a presence in both Canada and the United States. Counting more than 22,000 employees in all its locations, this company has witnessed steady business growth for the last 20 years. One of its business areas even performed a yearly growth of double digits for the last 10 years. The company is considered a leader in its industry with a strong position in its market. That being said, competition has been putting more and more pressure around the customer and added value service through information technology and other innovations. Looking to sustain its leadership position, and evolve in its market, the company's leaders have initiated multiple business transformation initiatives to steadily shift the organization towards a new vision. These initiatives range from changes focused on a process end-to-end, to a company-wide program with multiple projects under its umbrella.

Table 6-1. Summary of cases data sets

Case	Description	Number of interviews participants	Interviews duration (min)	Number of documents selected
Case 1	It is a project at a departmental level that aimed to re-engineer an end-to-end process with the implementation of a new information system. The project was considered a success by all stakeholders as it finished on time, under budget and delivered the business results expected.	6	516	120
Case 2	It is a company-wide program that was initiated by the CEO to change the organizational culture and put more focus on customer service. The program included projects focusing on: teams' organizational design, processes reengineering, and information technology changes. The overall program benefits were considered achieved, even if some projects under its umbrella were considered failures by their stakeholders.	4	293	43
Case 3	It is a project at a departmental level that aimed at redesigning how the department manages and executes on demand and opportunities. No information system changes were introduced. However, changes in behaviour and mindset were considered high for employees. At the moment of data collection, this project just started its delivery or execution phase and no evaluation on success was performed so far.	4	344	51

Table 6 1. Summary of cases data sets (Cont'd and end)

Case	Description	Number of interviews participants	Interviews duration (min)	Number of documents selected
Case 4	It is a program that aimed to implement or enhance multiple new information systems for one business area of the company. The program had five information technology projects. The program overall was considered a failure by all stakeholders which translated into a financial right off to overcome its costs at its closing.	5	465	120
Context	General information about the organizational context and the links between different business transformation initiatives.	2	131	16
	Total	**21**	**1749**	**350**

6.4 Results

The results and observations are derived from the themes extracted using the thematic analysis approach of the cases. Table 6-2 summarizes the key results and observations. To help structure the results, the following dimensions will be used (Espinal et al., 2012; Lee et al., 2008):

- Process : Identifies the sequence of steps and activities, and the identification of both inputs and outputs. It also includes elements of the planning procedure and technique used to support a step in the process.
- People : explores areas dealing with work organization such as stakeholders, roles, and governance.
- Technology: covers any tools (software, hardware, etc.) supporting the process activities.
- Organizational context specific: a grouping of key challenges and characteristics of project planning in the industrial partner's organizational context.

Table 6-2 : Summary of results and key observations from case studies

Dimension	Key results and observations	
Process	Planning scope and definition	• Each case has a different definition of planning scope • Each case has different boundaries definition of planning processes • Groups of planning activities can be identified across cases (see Figure 6-1)
	Planning activities and decisions	• Each case has a different sequence of planning activities • The importance and level of effort for planning activities is influenced by each case's team and stakeholders • The level of standardization of planning processes across cases is low, with the exceptions of IT related activities • The use of planning techniques (e.g. scheduling and resources levelling) is limited
	Planning deliverables	• Few planning artefacts and deliverables are shared between cases • The shared planning artefacts and deliverables have also a low level of standardization
People	Stakeholders	• Internal stakeholders (e.g. business units, departments) have a higher impact than external ones (e.g. suppliers, consultants) • The IT department has a consistent involvement across cases
	Governance	• Defining and implementing a governance model is an enabler of projects' success • Three levels of governance were identified across cases (see Figure 6-3) • Governance has a negative connotation in the organization
	Planning roles	• Five planning roles are identified across cases: decision maker, planner, facilitator, subject matter expert, and integrator • In each case, different resources would fulfil one or multiple planning roles
Technology	Planning activities support	• Limited use of project management software • Project management software capabilities may not be adapted to business transformations' needs
Planning maturity and practices in the organization	Challenges	• Lack of alignment between cases' participants on planning expectations • The absence of defined and clear projects planning guidelines in the organization • Projects or programs scopes, objectives, and expected benefits are not consistently defined and shared with teams and participants
	Link to organizational planning practices	• Influence of an operation-centric culture • Project management practices are not centralized and are defined for capital projects (e.g. engineering, IT) • Transposition of existing capital projects planning processes to business transformation projects

6.4.1 Process

6.4.1.1 Planning scope and definition

Interviews participants have different interpretations of project planning that reflect each one's perspective and project context. Such variation makes the definition of planning processes disparate between cases. The boundaries of planning processes vary across cases. In Case 1, planning included activities of process design and requirements gathering. And in Case 3, planning touched on key stakeholders' engagement, project scope, and objective clarification.

Attempting to look at what capabilities are present across cases, results can be aggregated into planning activity groups. Figure 6-1 summarizes this grouping for shared planning and control processes. Such a representation highlights the extended definition of planning beyond the typical activities (e.g. work breakdown, sequencing, scheduling) to include elements of scope definition, design, and stakeholder management.

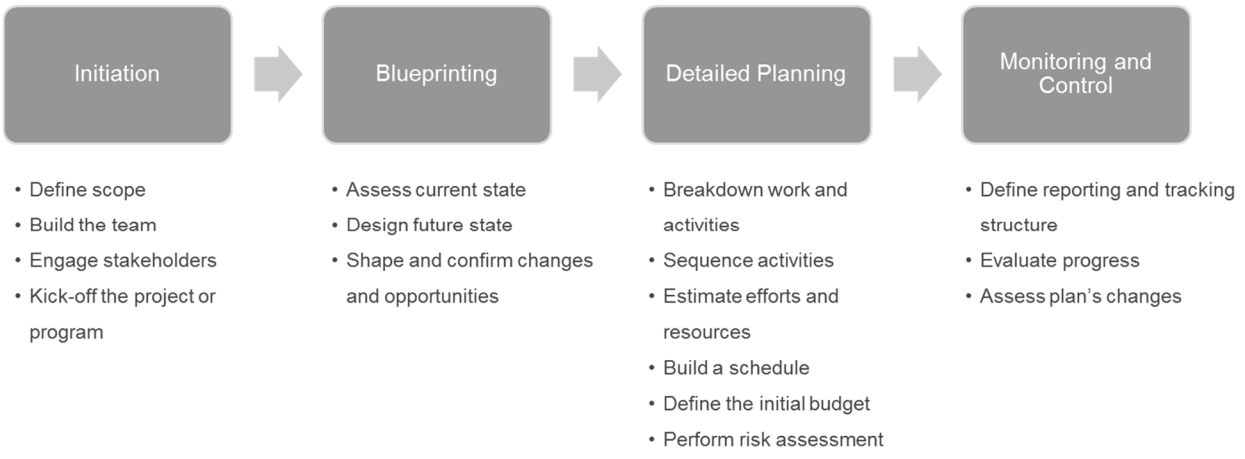

Figure 6-1. Cross-Cases Planning and Control Processes

6.4.1.2 Planning activities and decisions

Looking at the sequence of planning activities and decisions in each case, the data was mapped into a step-by-step process using a Business Process Model and Notation (BPMN) formalism (OMG, 2011). Each case has its particular planning processes. Some activities can be found in more than one case but they are not in the same sequence. For example, all cases used the organization's finance department process to build a business case and get approval for project funding.

In addition, the relative level of importance of planning activities varies between cases. It is influenced by the specific interests of the project team and the stakeholders involved. In Case 4, the executive decision makers put emphasis on the estimation of the costs and delivery time. Relatively to the other cases, this emphasis was noticeably more important and influenced the amount of effort put into estimation compared to other planning activities.

When comparing process maps across cases, the level of standardization arises as low. Each project was planned differently, using a different planning process and documentation. Using the example of estimation, each case performed the estimation of costs differently; how the resources were assigned and the logic and templates for estimations were also different. The exception was noticed when there are Information Technology (IT) components in the project. The IT department has a relatively more defined planning process. When IT is involved, the planning process has some standard elements, for example, the team of solution architecture provides an order of magnitude estimations using the same process and tool for Case 1 and Case 4. IT related elements are also the only ones found with a budget definition and tracking of costs. Other areas and departments do not have a defined budget, nor do they track costs of transformation projects.

Moreover, there is limited use of planning techniques such as Critical Path Method, Earned Value Management, and scheduling and resources levelling techniques. Such techniques are deemed too complex for the needs of the projects and the teams. When applied by project managers, they tend not to publicize their use, and their effectiveness on the planning and project success cannot be deduced.

6.4.1.3 Planning deliverables

For all cases, 124 project planning deliverables were identified (see Figure 6-2). Six of them can be matched and found across cases. The comparison was based on the documents' content and purpose, in addition to any Metadata that can be useful like document title and document identification if existent. This is also an indication of the lack of standardization of project deliverables and artefacts in the organization. Table 6-3 presents the deliverables encountered across cases. The project plan is a deliverable found in three out of four cases. However, the content varies for each case. It varies in the rigour of documentation, and also the components of project planning covered. The steering committee update is generally a presentation document for an executive team acting as the decision makers for the project. These documents tend to be the easiest to have access to, and are the ones best managed (structure, versions, owner, etc.).

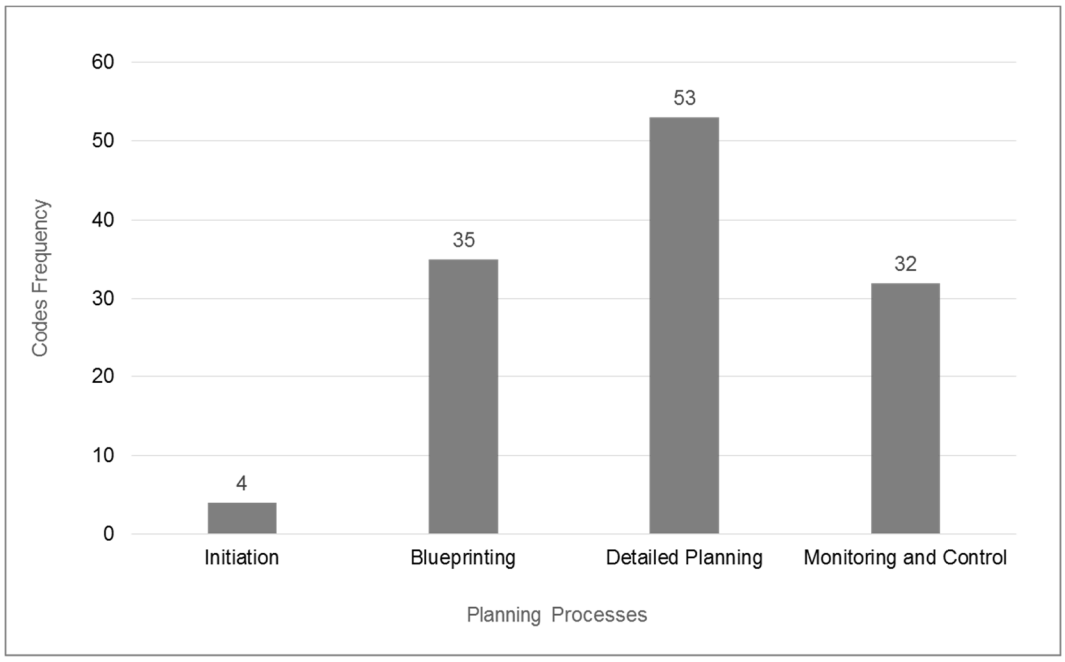

Figure 6-2. Thematic analysis - Frequency of codes of deliverables by planning processes

In summary, observations in the process dimension point to a variety of planning definitions between stakeholders and across cases. Planning and control processes have little standardization, and there is a clear influence of IT project management practices on the delivery of the cases selected. In addition, few deliverables and artefacts are consistent between cases, in line with observations about processes lack of standardization.

Table 6-3. Most common deliverables and artifacts across cases

Deliverable	Description	Comments
Expenditure approval	It is a form owned by the financial planning department. It is used for any type of expenditure required by any business unit. It acts as a business case documentation to explain the business needs for the required expenditure and an estimation of the total costs for the current year and subsequent years if applicable. This deliverable is usually created at the Initiation step of the planning and control processes.	This document is an artefact for an internal approval process. It is used as projects and programs formal business case artefact to get initial funding to start the project or program.
Project plan	A document that summarizes the key elements of a project or program planning output: scope, resources, schedule, risks, budget, etc. This deliverable is usually created at the end of the detailed planning process. It summarizes the activities done within this process.	Even without a clear standard on what a project plan should include, this artefact is present in 3 out of the 4 cases.

Table 6 3. Most common deliverables and artifacts across cases (Cont'd and end)

Deliverable	Description	Comments
Deployment strategy	A document that deals with the execution portion of any design or blueprint. It explains the approach to deliver the solution and implement the required changes. This deliverable is usually created at the same time as the project plan, at the end of the detailed planning process.	This document can also be called a roll out strategy or implementation strategy.
Change Management Strategy	A document that explains the audience analysis, the change impacts and how the change will be managed through a combination of activities like training, communications, etc. This deliverable is usually created at the same time as the project plan, at the end of the detailed planning process. In Case 1, it started during Blueprinting.	The change management team within the IT department has developed its internal practice planning methodology which includes the delivery of a change management strategy as an output.
Project schedule	It is generally a Gantt chart that shows the project or program key activities with the timeline of its execution. This deliverable is generated during the detailed planning process, at the "build the schedule" step.	The visual representation is common between cases. The level of details and elements in the schedule (e.g. resources) varies.
Steering committee update	A presentation providing an update on the progress for the steering committee, and when required provide inputs expecting a decision. This deliverable is recurrent in all the planning and control processes. Steering committees' updates start during initiation and continue until project closure.	It is often the only existing documentation of some planning activities and decisions (e.g. in Case 3 the evaluation of deployment strategies was only found in a steering committee presentation).

6.4.2 People

6.4.2.1 Stakeholders' analysis

During the thematic analysis, data was codified to identify stakeholders that both are involved and impacted by the projects and their planning. Table 6-4 presents the frequency of codes assigned by internal and external stakeholders. Across all cases, internal stakeholders have a higher weight and impact on the planning than external ones. Most of the external stakeholders are suppliers and vendors providing resources to the transformation projects. In Case 1, vendors were present both as management consultants to support the definition of the project and its objectives, and as technology integrators to configure and implement the new software.

Table 6-4. Thematic analysis - Frequency of codes assigned to stakeholders

Stakeholders	Case 1	Case 2	Case 3	Case 4	Total
External Stakeholders	253	167	22	87	529
Internal Stakeholders	1241	572	569	1350	3732
Total	1494	739	591	1437	4261

Looking specifically at internal stakeholders, one department has a consistent involvement across cases with high impact and influence: Information Technology (IT). It indicates that for this specific organizational context, a transformation would imply an important IT component, and as such, the IT department is active in most transformational projects in the organization. In addition, in this organization, the IT department has historically provided internal consulting services to encourage other groups to think about business aspects before initiating an IT project. Teams of change management specialists, strategic planners and business process analysts would support other departments in an array of problem-solving initiatives. This has put the IT department as an internal partner to initiate transformational projects. The amount of information technology projects and investments has increased in the organization for the last 10 years. This was partly due to an organizational strategy favouring other assets like machinery and facilities over technologies.

6.4.2.2 Projects governance

For all cases, governance was frequently identified in interviews and documentation as a success factor for the projects in general, and for an effective project planning in particular. In each case, a governance structure was established. Figure 6-3 describes the governance structure common across cases.

However, implementing governance and leveraging it to structure decision-making for project planning were not present in all cases. Case 4 did not have an effective governance structure until late in its execution. This gap was identified as one of this case's lessons learned. Case 4 was one of a list of other projects in the organization that failed partly due to a lack of effective governance. Therefore, decision-makers in the organization became more attentive to its importance. Another challenge for the definition and implementation of projects' governance is its perception in the organization. For many employees, governance was perceived as negative, meaning oversight and

bureaucracy. The importance of governance for effective decision-making in projects does not seem to be understood.

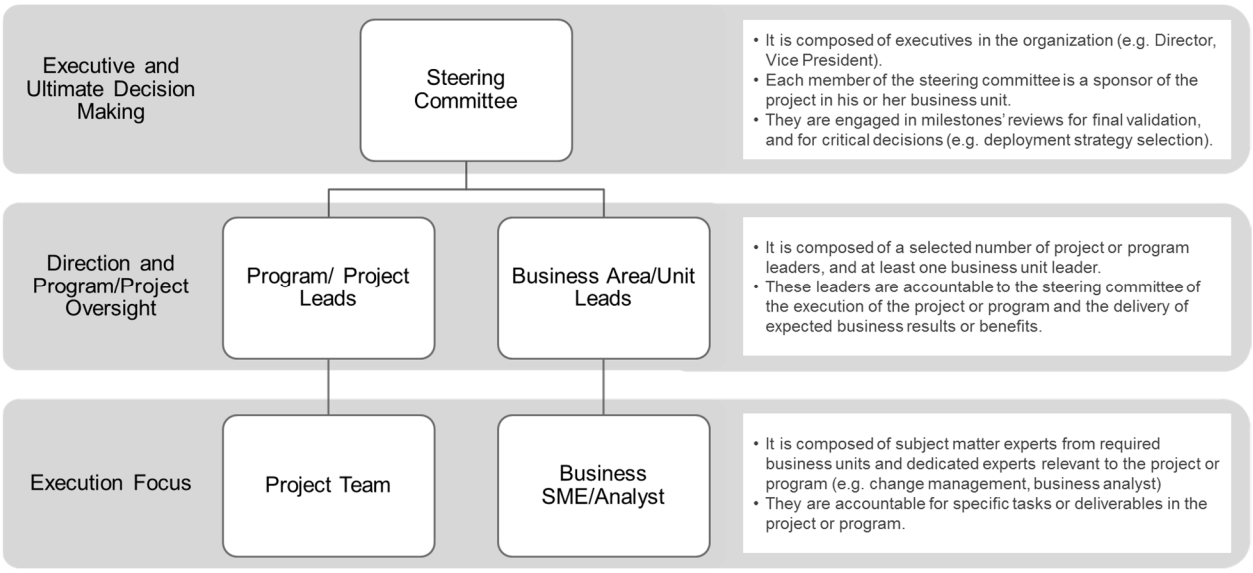

Figure 6-3. Common project governance structure across cases

6.4.2.3 Planning roles

During data collection, planning roles were defined as the sets of specific responsibilities and activities or decisions that can be associated with the project's planning. Interviews participants were asked to describe their role in the project and specifically for the planning activities. Within each case, key planning roles were identified. Meanwhile, comparing the roles across-cases showed variations in their responsibilities. For example, the sponsor's role during planning ranged from active participation in the planning decisions to passive participation through approval and reviews of planning deliverables.

Nonetheless, the traits of planning roles can be detected across-cases. Grouping these characteristics led to categories of roles emerging through the data review and they can be summarized as follows:

1) Decision maker: A role where the focus is on receiving information and taking decisions on the direction of either planning or the execution. In Case 1, the majority of planning decisions were jointly taken by the project manager and the business unit's lead on the project.

2) Planner: A role where knowledge of planning practices is required and who centralizes all planning information, tools and outputs. In Case 4, the program control officer was responsible for all planning activities. She provided the knowledge of techniques and tools and she owned the planning deliverables.
3) Facilitator: A role that engages and coordinates any type of work or conversation during the planning and execution. In Case 3, the project manager was also the facilitator in all workshops and decision-making sessions.
4) Subject Matter Expert: A role with business or technical expertise that will participate in the planning process by providing and receiving information. In Case 1, experts in existing business processes were dedicated to supporting project planning.
5) Integrator: A role focused on analysis and establishing connections between components both technical and human. In Case 2, a selected team of internal consultants were the "glue" connecting all progressing initiatives in the program.

One person would fulfil multiple roles during a project. In all cases, the project manager has fulfilled the roles of planner, facilitator and an integrator. The level of effort and dedication to each role by the project manager varies. In Case 3, the project manager was also a subject matter expert. This outlines the importance of leadership skills like facilitation and integration to plan transformation projects. There is also an indication of the criticality of selecting a project manager with the appropriate skills and experience for such projects. Expertise on the subject of the project is seemingly less impactful than facilitation and integration abilities. This also introduces a challenge to the organization of finding the appropriate project resources, to plan and lead a transformation project. It is a shared pain point between all cases the difficulty to find resources with the required skills combining both subject matter expertise and leadership and management skills adapted to the projects' needs. Added to that, and as in all public companies, financial performance and guidelines have an important bearing and influence on how decisions are made. In this organization, capital expenses are preferred to operational ones. As such, decision makers always delay any resource allocation to the initiation and planning of projects, as these phases' costs are purely operational. This explains the frequent delays in having the appropriate skills and expertise during projects. In addition, the understanding of the roles required to plan a transformation project is different from the true expectations of the project. It led to many cases of misused expertise and difficulty to engage a skilful team to lead the project.

6.4.3 Technology

As for any process in an organization, project planning can be supported by different tools and technologies, especially software with capabilities to perform many of the planning activities. Such software has a limited presence in the planning process of the cases studied. Evidence of the use of Microsoft Project was found, and its usage was limited to the generation of a Gantt chart for presentation and communication purposes. Some teams, especially in IT, have developed their specific planning Excel-based tools. These teams use input provided from projects requesting resources to evaluate workload required and estimate resource allocation and costs. Across cases, the use of the software is rudimentary and does not leverage the full potential of such technologies to support planning activities.

The organization has access to some project planning tools but is not leveraging them to their full capabilities. It is partly explained by a lack of training and coaching on such tools. They are considered “productivity enhancement” tools, and as such, no official training is provided. In addition, in the cases selected, team members do not have the same level of comfort with using the software. It is challenging for project managers to select and use software to support project planning. For example, in all cases, SharePoint was used as a document management and information sharing platform. In Case 3, it was used as a planning tool, where the workshops’ schedule, participants, objectives, and documentation were managed. However, after a few weeks, the project manager observed that few participants actually used SharePoint properly to consult workshops schedule and upload relevant information.

Some interviewees indicated that an important portion of the project management software capabilities is not required for a transformation project in the organization (e.g. tracking budget and cots), or that they are not adapted to a transformation project’s context.

6.4.4 Planning maturity and practices in the organization

Comparing the planning processes of the selected cases indicates that defining planning is dependent on the project and participants’ perspectives. Projects’ participants do not share the same understanding of planning processes, and they are at different levels of planning knowledge proficiency. Whoever is acting as a project planner faces an audience that was not sensitized to how planning is performed and why some steps are required before starting project execution. It

resulted in a lack of engagement in the planning processes where participants thought they were not adding value. In Case 3, the project manager had to put important efforts into familiarizing project team members and participants with project planning processes, techniques and tools.

Added to that, there are no planning guidelines for projects in the organization. And for the selected cases, the project teams did not clarify how planning activities should be performed, or what the expectations were. This led to ineffective planning practices and misalignment where multiple stakeholders were interacting to build one project plan.

Specifically, it is common that the scope, objectives, and expected benefits of a project or program are not explicitly and clearly defined. The definition of scope can be improved, especially to underline its importance and define how it will be managed during the project. In Case 4, the insufficient clarity of scope and objectives led to the generation of a new plan frequently to match the changes in scope and in direction.

Considering the organizational context, few elements about the culture and project management practices are important to mention. The organization has been putting most of its focus on its operations efficiency. It has been the driver of investment's decisions and changes for the last 20 years. It has a strong operation-centric culture where planning and execution of its core operational activities are mature compared to competitors in the industry. However, other planning practices (e.g. Sales and Operations Planning) have lower priority, and the organizational culture has long resisted the implementation of such structured planning processes.

The majority of its projects are capital-based and oriented towards improving its assets; e.g. construction and IT type of projects. Project Management Offices (PMOs) exist within two departments; IT and Engineering, where an important portion of the budget is directed towards capital projects. Nonetheless, there are no defined project management practices in the organization overall. And the PMOs are solely focused on specific departmental projects with little interactions with other business units. This can partially explain the lack of project planning processes standardization. From the selected cases, the organization applied planning processes and practices from capital projects to transformation projects. This direct transposition yielded many challenges and not as effective results. The context and type of work in transformation projects are different and may require an adaptation of planning processes and practices. Most importantly, the definition

and management of scope changes. All selected cases, whether considered successful or not have reported challenges in the definition of their scope, and keep changes controlled.

6.5 Discussion

One noticeable result from these case studies is variety. The definition of what planning is as a scope and as a process was different for each case and the use of project planning techniques depended on the project. This variety points to the need for an adaptation of planning processes and practices to the project's specificities. This is echoed in the literature where project planning is widely debated (Alexander Laufer et al., 1994). Planning scope and practices depend on the project's industry and organizational context (Serrador, 2015). This led researchers to use planning definition to their studies contexts. For instance, Serrador (2013) uses a planning definition inclusive of any activities or phases before project execution.

This study's cases share a few project planning processes. The differences in planning activities and deliverables indicate a low level of standardization within the organization. This may be interpreted as an example of the multiplicity of project planning (Alexander Laufer et al., 1994), where each project's peculiar environment requires a situational analysis that guides the planning approach and processes. Another interpretation may be the low application of project management best practices (Ofer Zwikael, 2009). With the presence of various project management bodies of knowledge and frameworks (International Project Management Association, 2015; Office Of Government Commerce, 2009; Project Management Institute, 2017) one may expect a higher level of similarities, especially in one organization.

The exception in this study's results was related to IT components in projects. First, this highlights the role of information technology in enabling business transformations. The industrial partner's specific context is shared with many organizations that rely on IT to ignite and lead business transformations (Venkatraman, 1994). Information technology practices have become core capabilities to plan and deliver business transformations (Uhl et Gollenia, 2013). Second, the high involvement of IT implies the influence of IT project practices on how business transformations are planned and delivered. As mentioned by Serrador (2015) information technology is one of the industries with a highly developed project planning literature and practice. However, such a

transposition of project practices may not be optimal for business transformation situations (Cha et al., 2018).

Compared to project management bodies of knowledge (Office Of Government Commerce, 2009; Project Management Institute, 2017), many activities found in these cases to be part of the planning efforts are classified in other phases of the project or another process group. For example, the clarification of the project's objectives is classified in the scope definition process group, and the results of this study indicate that it can also be present in planning. In addition, in project management references and guides, planning processes have the highest number of deliverables used as inputs and outputs (Project Management Institute, 2017). The data from the selected cases suggest that in practice a limited number of these deliverables is actually being used to plan a transformation project. It seems that, in the context of this study, project planning references and project practice have a gap in both the association of activities and artefacts required for planning. Here, again, is an indication of how current project management practices may not be suited for business transformation contexts.

Results on governance and planning roles point to the importance of leadership and "soft" skills for effective planning of business transformations. In practice, there is much focus on the project manager's technical skills around scope definition, scheduling, budgeting, and earned value management (A Laufer et Tucker, 1987). There is also leadership skills that a project manager needs to be effective at leading a business transformation project. The cases at hand point towards facilitation and integration as the most effective skills in such a context. Studies in the literature show "soft" skills are increasingly important for the organization when recruiting project managers (Ahsan, Ho et Khan, 2013), specifically the impact of such skills on the quality of planning (Globerson et Zwikael, 2002).

Finally, the literature indicates that overall project management tools are underused. And it is for similar reasons as the ones found in this study: lack of training on the tools, the disparity in the level of technological competency (Andersson et Johansson, 1996; Herroelen, 2005). In this study, many project management technologies' capabilities are found to be an additional complexity to the project team in business transformation context. Meanwhile, other functionalities are missing pushing teams to manage such projects using ad hoc tools. This is another indication that planning

practices and tools were developed for capital projects and are not adapted to business transformation projects.

6.6 Conclusion

Using a qualitative multiple case studies approach, this article explored the practices and processes of planning for business transformation projects. The results indicate that, in this category of projects, planning definitions vary and its scope is extended to a wider set of activities typically found in other project phases or management processes. Specifically for this organizational context, the process of project planning is not standardized and is influenced by capital projects. Which may indicate a need to review or adapt project planning for the context of business transformation.

This article adds to the literature by adopting an exploratory approach to study project planning as a process. It also contributes to the argument in favour of an adaptation of project management processes to specific projects categories, in this case, an adaptation of planning practices and processes to business transformation contexts. This study's results and conclusions are limited by the specific organizational context it was conducted in.

For future research, extending this exploration of planning processes to other organizational contexts would strengthen the results and highlight opportunities on how to adapt existing practices and processes to business transformations. Results could also be validated through additional and complementary research approaches such as surveys of practitioners and projects managers.

CHAPITRE 7 ARTICLE 3: AN EXPLORATION OF CONCEPTUAL PLANNING FOR BUSINESS TRANSFORMATION PROJECTS

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Abstract

Conceptual planning has been proven to enhance the success of engineering and construction projects. This study explores the value and specific elements of conceptual planning in the context of business transformation. Using a multiple case studies approach, this article identifies six elements of conceptual planning applied in these contexts: governance, design, rules and guidelines, delivery strategy, horizon, and levels of planning. The particularities of their application in business transformation are discussed. This study argues in favor of an adapted conceptual planning process for business transformation projects. It contributes to the literature on a further adaptation of project management practices to specific projects' categories and contexts.

Keywords: Project Management, Planning, Conceptual Planning, Business Transformation

7.1 Introduction

In engineering and construction projects, conceptual planning has been used to improve the definition of the projects' scopes and objectives, and to perform initial risk and environmental analyses supporting projects' design and planning decisions. In the literature, conceptual planning can also be referred to as front-end loading, pre-project planning, front-end engineering design, feasibility analysis, programming design, schematic design, or early project planning. It is a practice that proved to enhance engineering and construction projects' success chances (Construction Industry Institute, 2016; Pinto et Prescott, 1988).

The use of such practice has been driven by the criticality of engineering and construction projects, and their impacts on organizations' profitability and competitiveness. Before committing important resources to a project, involved organizations use conceptual planning to reduce risk and gather important information for more detailed and definite design and planning (Van Der Weijde, 2008).

Business transformation represents another category of projects that share analogous impact and bare on organizations' future. It is defined as complex and large change projects in organizations that alter how work is done and how value is delivered (Purchase et al., 2011). Business transformation projects have a high failure rate ranging from 40 to 70 percent (McKinsey, 2008b; Nohria et Beer, 2000).

It is argued that project management processes and practices are not adapted to the context of business transformation, requiring further exploration and adaptation (Cha et al., 2018). Conceptual planning is no exception. Considered of value for engineering and construction projects, there is a lack of studies exploring its value and specificities in other projects contexts and categories. Moreover, there is a growing argument in project management literature in favor of projects' categorization (Archibald, 2013) and context adaptation (Besner et Hobbs, 2013; Niknazar et Bourgault, 2017).

This study aims to explore the value and elements of conceptual planning in business transformation context. Using a multiple case studies approach, it investigates current planning practices in business transformation projects to examine the need and specificities of conceptual planning for this category of projects.

This article begins with a literature review on conceptual planning in engineering and construction projects. It will then outline found elements of conceptual planning in current business transformation literature. Next, the research methodology will be summarized with a presentation of the case studies. Afterward, the results will be exhibited and discussed. Finally, this article's contributions will be summarized and research limitations and opportunities will be identified.

7.2 Literature Review

7.2.1 Conceptual planning in engineering and construction

At first, conceptual planning was defined for large projects in two fields; engineering such as oil and refineries (Jergeas, 2008; Spangler, 2005; Van Der Weijde, 2008), and construction (Gibson, Bingham et Stogner, 2010; Gibson, Kaczmarowski et Lore Jr., 1995; Menches et Hanna, 2006). In the construction industry, the research efforts were led by the Construction Industry Institute (CII) (Gibson et al., 1995) which defines conceptual planning as:

> "The process of developing sufficient strategic information for owners to address risk and decide to commit resources to maximize the chance for a successful project" (Construction Industry Institute, 1995)

To guide and support the process of conceptual planning, CII developed a project scope definition tool for construction projects: the Project Definition Rating Index (PDRI) (Construction Industry Institute, 1996). The tool was initially designed for industrial construction projects. Then, it was

expanded for other types of construction projects, like infrastructure projects (Gibson et al., 2010), manufacturing and life sciences (Construction Industry Institute, 2018), and for specific organizations like NASA (Gibson, 2000). Even though the initial development of theory and tools was for large projects, the literature has also argued for the value of using conceptual planning for small projects as well (Collins, 2015; Wesley, Kristen et Edward, 2017; Wesley, Kristen et Gibson, 2018).

The fundamental driver to use conceptual planning is the ability to influence the design and delivery of the project early in its lifecycle, while the costs and impacts of doing so are still relatively low (Construction Industry Institute, 1995; Samset et Volden, 2016). The project costs ramp up reaches a tipping point at the end of conceptual planning, after which the resources commitment and interdependencies in the project become important for any change to take place without additional complexity or loss (Van Der Weijde, 2008).

There is a consensus in the literature on the benefits of conceptual planning on the design and construction cost and schedule. Various studies have shown that conceptual planning increases projects' success rate (Construction Industry Institute, 1995, 2016), and has a positive impact on their outcomes (Gibson, T. et P., 2006; Menches et Hanna, 2006). It also increases the probability of meeting both the project's goals and environmental constraints. In addition, performing a good conceptual planning process allows for a better assessment of the project's risks and feasibility (Construction Industry Institute, 2016). It ensures a strong leading team is in place to perform the project's most appropriate execution strategy. Conceptual planning is a phase during which one would consider context-specific parameters such as suppliers' relations and governmental legislation. Furthermore, it integrates additional requirements before the detailed design like constructability (Tatum, 1987), and safety (Al-Dousari, 2016).

The ultimate objective of conceptual planning is to get a decision on whether to proceed with the project or not. The outputs of the process supporting the decision would be associated with key deliverables such as "project definition package" (Construction Industry Institute, 1995; Gibson et al., 1995). Looking at the components of such deliverables indicates the content of conceptual planning process activities, for instance:

- The scope: clarify and detail the project's scope and objectives;

- The alternatives: conceptual evaluation of different alternatives to deliver the project's requirements under its known constraints; and
- The business case: an overall financial and technical evaluation of the project's value and costs.

Conceptual planning revolves around the assessment of the project before it launches its detailed design and planning. Jergeas (2008) identifies three areas of assessment:

1) Internal to the project: assessing the requirements of the deliverables and the internal characteristics of the project;
2) External to the project: evaluate the current project compared to other similar projects in the industry to ensure sound design direction and realistic planning; and
3) Risk: an evaluation of all types of risks facing the project including financial, environmental, legislative, etc.

Even though it is recommended for organizations to develop and standardize their specific conceptual planning practices (Construction Industry Institute, 1995), a common process can be identified as a starting point (Gibson et al., 1995; Sarde, Peth, Galli et Katta, 2016). Figure 7-1 summarizes the four sub-processes of conceptual planning.

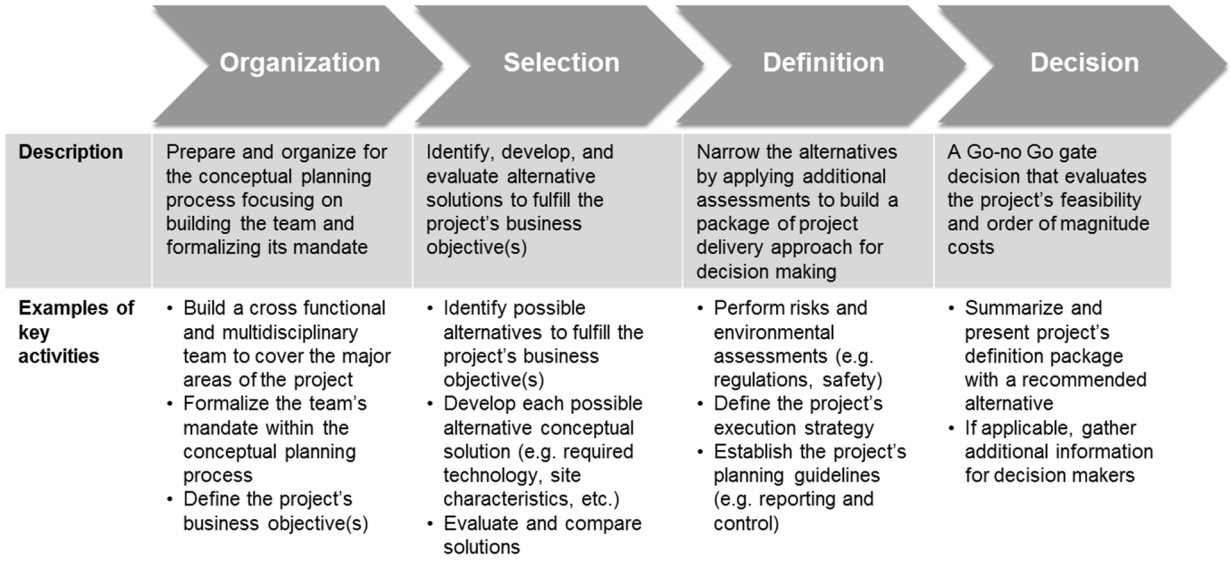

Figure 7-1. Conceptual Planning Processes

7.2.2 Elements of conceptual planning in business transformation frameworks

To support the planning and execution of business transformations, various methodologies and frameworks are proposed in the literature (Bjelland et Wood, 2008; Chapman, 2002). Their structure varies between prescriptive through structured methodologies (Nightingale et Srinivasan, 2011) and descriptive through capability models (Uhl et Gollenia, 2013).

Planning plays a central and crucial role in the success of business transformations (Levene et Braganza, 1996). And across the different frameworks, planning effort is put forward as a separate phase in the transformation lifecycle (Nightingale et Srinivasan, 2011) or a specific step in a methodology (Kettinger et al., 1997). Elements of conceptual planning can be found in the literature on business transformations. For the most part, they consist of assessment tools, design, and building the team.

The assessment of the organization for a business transformation is a key activity in all frameworks. As such, various assessment tools were proposed to structure and guide the analysis of the organization and its environment. For example, Perkins et al. (2010) propose a decision support methodology and tool that serves as "an integrated, analytical framework for diagnosing and improving overall enterprise performance". Other models derived from other fields were also suggested as tools to assess the organization's strategy such as enterprise architecture (Donaldson et al., 2015). Besides, consulting firms have developed their own assessment tools based on their projects and experience, and the McKinsey 7S model is an example (McKinsey, 2008a). These assessment tools share similar traits with models and tools in engineering and construction projects and are central to conceptual planning (Jergeas, 2008).

However different these assessment tools and models are, they ultimately serve to design the future state of the organization. They support the identification of required changes to achieve the desired objectives. Kettinger et al. (1997) use processes as the key to redesigning the organization and they propose a detailed methodology that includes both a diagnosis of current processes and a redesign of future state processes. Nightingale & Srinivasan (2011) propose a more holistic enterprise design approach that similarly evaluates the current state from multiple views, then designs a future enterprise in an integrated manner. In other frameworks as well, these elements and activities of organizational design are predominant and represent an important portion of their methodology (Bucy et al., 2016; Bürkner, Fæste et Hemerling, 2015; Uhl et Gollenia, 2013). This focus on the

early design of the future organization is comparable to the efforts of identifying and developing alternatives in the conceptual planning process in construction projects (Construction Industry Institute, 1995).

In addition to proposing frameworks, the business transformation literature identifies also success factors. Strong governance and the team are key success factors (Cowan-Sahadath, 2010; Purchase et al., 2011). Business transformation frameworks emphasize engaging stakeholders and building the team. Some frameworks dedicate a phase or a cycle in their methodologies to ensure the transformation team is in place and key stakeholders are engaged before launching further efforts (Nightingale et Srinivasan, 2011; Uhl et Gollenia, 2013). Such focus on the team is suggested to happen very early in the lifecycle of a business transformation initiative. This is in line with the first sub-process of conceptual planning for construction projects, which focuses on organizing and building the team (Construction Industry Institute, 1995).

In summary, conceptual planning literature has focused mainly on large engineering and construction projects. Conceptual planning processes and practices have been adapted to smaller and more specific types of projects. However, all these efforts remained within the context of engineering and construction. In addition, business transformation literature covers some of the elements of conceptual planning, but not all of them. Thus, the literature review confirms the gap around the overall process and practice of conceptual planning in the context of business transformations and to what extent it is valuable and adaptable.

7.3 Research Methodology

7.3.1 Multiple case studies approach

The objective of this study is exploratory to evaluate the need and applicability of conceptual planning for business transformation projects. For such a qualitative exploration of a concept, a research approach using case studies is suited (Yin, 2014). Since business transformation is a sensitive subject for organizations. They are expected to withhold sharing such confidential knowledge. Consequently, the focus was first to partner with a company willing to share information and where multiple cases of business transformations can be found. Once an industrial partnership was established, embedded multiple case studies were used (Noor, 2008; Yin, 2014). This research methodology provides an in-depth understanding of how a phenomenon takes place

in the organization by comparing multiple cases. In this study, the interest is in the context of business transformation and how such initiatives were planned.

Four business transformation initiatives were selected with the help of an internal team within the industrial partner's organization. The cases were selected based on the scope and relative impact of the change to the organization as well as data availability. The data collection revolved around in-depth semi-structured interviews with participants in each case. This initial set of data was then complemented by a selection of documentation available for each case. To support the understanding and interpretation of the data, some general organizational context documentation was also gathered. The selected cases and their related collected data are summarized in Table 7-1. The overall data collection was spread from October 2015 until June 2016 and the cases covered a period of six years from 2010 until 2016.

The selected data was then analyzed using a thematic data analysis approach that codifies qualitative data and groups it into themes (V. Braun et Clarke, 2006). Nvivo 12 was used as a qualitative data analysis software to support the collection, structure, coding, and analysis of the different data sources (Bazeley et Jackson, 2013). Case-by-case and cross-case analyses were performed to compare conceptual planning elements and identify shared observations and results (Eisenhardt, 1989; Krippendorff, 2004; Yin, 2014).

7.3.2 Organizational Context

The industrial partner is a North American public company with a capitalization over 40 billion US dollars. Operating in the industry of transportation and logistics, it has a presence in both Canada and the United States. Counting more than 22 thousand employees in all its locations, this company has witnessed steady business growth for the last 20 years. One of its business areas even performed a yearly growth of double digits for the last 10 years. The company is considered a leader in its industry with a strong position in its market, even with other products and services competing and putting more and more pressure around customer added value services through information technology and other innovations. Looking to sustain its leadership position, and evolve in its market, the company's leaders have initiated multiple business transformation initiatives to steadily shift the organization towards its new vision. These initiatives range from changes focused on a process end-to-end to a company-wide program with multiple projects under

its umbrella. In this article, the industrial partner will be referred to as the company or the organization.

Table 7-1. Summary of cases data sets

Case	Description	Number of interviews participants	Interviews total duration (min)	Number of documents selected
Case 1	It is a project at a departmental level that aimed to re-engineer a process end-to-end with the implementation of a new information system. The project was considered a success by all stakeholders as it finished on time, under budget and delivered the business results expected.	6	516	120
Case 2	It is a company-wide program that was initiated by the CEO to change the organizational culture and put more focus on customer service excellence. The program included projects that did teams' organizational design, processes reengineering, and information technology changes. The overall program benefits were considered achieved, even if some projects under it were considered failures by their stakeholders.	4	293	43
Case 3	It is a project at a departmental level that aimed to redesign how the department manages and executes on demand and opportunities. No information system changes were introduced. However, changes in behavior and mindset were considered high for employees. At the moment of data collection, this project just started its delivery or execution phase.	4	344	51
Case 4	It is a program that aimed to implement or enhance multiple new information systems for one business area of the company. The program had 5 information technology projects. The program overall was considered a failure by all stakeholders that translated into a financial right off to overcome its costs at its closing.	5	465	120
Context	General information about the organizational context and the links between different business transformation initiatives.	2	131	16
	Total	**21**	**1749**	**350**

7.4 Results

Following the thematic analysis of the case studies, six themes related to conceptual planning emerged from the data. These themes were selected based on their coverage across the different

cases and their link to one or multiple conceptual planning elements identified in the literature. The observations and results will be presented according to the following identified elements:

- *Governance* identifies decision makers and dynamics for planning roles and responsibilities;
- *Design or blueprint* is a collection of steps and activities for current situation assessment and future state definition and design;
- *Rules and guidelines* identify specific directives and rules on how planning will be performed;
- *Execution or delivery strategy*: is translated into how the project will be decomposed in phases, iterations or waves. It defines the overall structure of the project delivery approach;
- *Horizon of planning* represents the timeframe where information is available to build a viable plan; and
- *Levels of planning* reflect the extent of planning details and how they link together.

7.4.1 Governance

In all cases, the definition of a governance model was identified as a key enabler when it was well deployed, or as a lesson learned when it was missed. For this organizational context, governance mainly included:

- *The identification of the decision makers for the project or program:* they primarily are; a sponsor, a project or program lead, and a business lead who represents a counterpart to the project or program lead with specific business knowledge and expertise.
- *The clarification of roles in planning decisions*: clarifies who will be involved in taking planning decision and how interactions with specific teams or practices will take place, especially for cases with Information Technology (IT) components.

In Case 4, the program implemented a governance model several months after it started. The lack of structure in decision-making was considered one of the main reasons for the program failure. Contrarily, Case 1 was purposefully structured to have a strong governance model in place. This project was used as an example of good project governance in the organization.

7.4.2 Design

Across cases, design was also referred to as blueprinting or assessment. Its elements were present as activities or as a separate phase in the project or program lifecycle. In all cases, the objectives and deliverables were similar and shared the following aspects:

- *The analysis of the current situation*: A set of activities to understand the current state of the organization in scope. It allows the level setting of all stakeholders and team members on the facts of the current situation. It also structures the assessment of opportunities for the future. It relies on the use of an array of analytical tools like process analysis, requirements elicitation, and organizational design. It is frequently combined with organizational change management techniques such as stakeholders' analysis and audience change impact analysis. It is an important step in managing the change in the organization and preparing for the transition.
- *The design of a future state*: A set of activities that explores opportunities and identifies options and scenarios to build a future state of the organization in scope. It defines the future state in as much detail as possible ensuring a holistic perspective. Different frameworks of design can be leveraged that evolve around the dimensions of process, people, technology, and data. Future state design relies on techniques for creative thinking and facilitation.
- *The identification of gaps*: Comparing the current and future states of the organization, a specific set of changes are identified that will bridge the gap and allow the organization to make the transition. Very similar to a work breakdown approach, it focuses on defining what changes are required but does not specify how they should be implemented. Special attention is put into minimizing the required changes and their degree of radicalness to the organization.
- *Building a roadmap of changes*: Starting from the list of required changes, an overview of the sequence of implementation is built. It is at a capability level identifying the change or what is expected to be implemented. An important component of building the roadmap is the integration of technical aspects (e.g. information systems, processes) and organizational aspects (e.g. skills, talent). The roadmap orchestrates what and when changes should be implemented and the crucial links between them.

In Case 3, all the elements of design were performed in a series of workshops. Using a process-focused approach, the goal was to build a future process with a definition of new roles and associated templates and artifacts. In Case 2, a combination of organizational assessments, benchmarking, and customers feedback supported the definition of changes to make in the organization. Performed at the program level, this design defined groups of changes that were assigned to project managers or business groups' leaders to implement.

7.4.3 Rules and guidelines

When it comes to the planning processes and practices, each case has its own. It is difficult to identify a standard or pinpoint shared planning practices. Nonetheless, in each case, guidelines were defined to steer how planning will be performed. It indicates that each case had its own rules and guidelines for planning that can cover items like:

1. *General and specific assumptions and constraints*: Identify common assumptions defined at the organizational levels that could influence the project's plans (e.g. resources rates inflation rates are defined by the financial planning department) or project-specific assumptions.
2. *Definition of selected or preferred planning techniques and tools*; Identify planning techniques that are selected for the project (e.g. the use of Product Breakdown Structure PBS for work decomposition).
3. *Identification of specific measures to track*: Defines the performance indicators that will be relevant for the project. They may be a combination of project delivery measures (e.g. actual costs against budgeted) and measures specific to the business context or end product (e.g. users adoption for information system implementation)

In Case 2, a centralized team defined overall program guidelines on how planning will be performed for all initiatives (e.g. a yearly plan was expected, and resources should be approved through the yearly budgeting process) and what will be the mechanisms for a quarterly and yearly tracking and reporting. This struck a balance between providing guidance ensuring some consistency for the program and granting each project the liberty to plan without a burdening set of program constraints.

7.4.4 Delivery strategy

Each case had a distinct delivery approach and project or program structure, even for cases like Case 1 and Case 4 where the nature of the changes and the technological implications were similar. Also, the derived project or program lifecycles varied for each case. Some of the phases may be the same or had equivalent names. The sequence of phases and how they are linked were different. Across cases, some elements emerged as influencers of the delivery strategy definition. They can be summarized as follows:

4. *Delivery decomposition*: It is about deciding how the overall project or program will be structured in terms of lifecycle phases, waves, or iterations. It takes into consideration how the overall planning of the project or program will take place: one dedicated phase of planning, multiple planning phases in iterations, etc. In Case 1, the software and integrator selection was defined as a separate phase in the project. However, in Case 4, a similar set of activities and deliverables was included in the initial program assessment and blueprinting phase.
5. *The sequence of phases and their scope*: Depending on the available information and some organizational constraints, the sequence of phases or any other decomposition element is decided. In Case 1, the software and integrator selection phase took place before the project's detailed planning phase. Meanwhile, in Case 4, the detailed planning preceded the choice of the software and the onboarding of the integrator.

7.4.5 Horizon

As in many projects dealing with complexity and uncertainty, participants in the case studies expressed challenges in identifying the required time horizon for planning so it is appropriate and realistic for their project. The data shows that different time horizons are considered in the planning of each case and, across all cases, three horizons of planning exist:

1) *Long term*: It is equivalent to the overall duration of the project and program. It is determined by the business results and benefits expected;
2) *Midterm*: It coincides with the organization's budgeting timeline of one year with a quarterly financial reporting. It translates into a quarterly overview of the project or program activities;

3) *Short term*: It is focused on the priority at hand or the key activities on the critical path of the project or program.

For all cases, the question of how far does available information allows the planning of the project was not consciously thought through. It meant that the horizon of planning did not actively take part in the selection of the planning approach nor in shaping the delivery approach. In addition, in the industrial partner's organization, business planning is performed yearly with a projection for one to two years. Any type of plan in the organization is usually for the next budget year. Most of the planning decisions and how far in the future they go is limited by the budgeting approach that focuses on one year only. Even for multi-year programs, like Case 2, the plan was defined for the coming year. This indicates that the time horizon for these cases is limited to the short term and are independent of the expected duration of the project overall. There is little evidence of a conscious evaluation of the available information and what horizon of planning can be covered by it.

7.4.6 Levels

To help with the complexity of the planning project, hierarchical planning is a practice to decompose the focus and details of plans at different levels (Hans, Herroelen, Leus et Wullink, 2003). Planning in each case happened at different levels that reflect both the focus and the accountability of each level of planning. The following levels can be deduced by comparing the four cases:

6. *Roadmap or program level*: An overview of the transformation focusing on business benefits and integration between projects in progress;
7. *Project level*: One specific project with a defined scope and deliverable. Focus on execution and delivery of one specific result;
8. *Practice level*: Focused on one deliverable assigned to a specific team in the organization; and
9. *Task level*: Focus on one specific task that is generally important such as workshops, to execute on a specific goal.

For each case, not all levels of planning were present. At least three levels can be found for each case. In Case 1, there is evidence of a project level planning with the scope of an information system configuration and implementation. At the practice level, Case 1 had a set of deliverables

assigned to the solution integrator, a vendor, which built and executed on his own plan for them. Some workshops were crucial to the project and were planned in detail by the project manager and the business analyst who facilitated them.

The planning levels are linked with the time horizons. Figure 7-2 summarizes these links. At the task level, the focus is usually on short term execution of a deliverable or objective. In Case 1, the business analyst and the business engagement manager defined a three weeks detailed schedule for the preparation of supplier and software selection criteria definition. The planning was limited to two resources, one deliverable, and a three weeks timeline. At the practice level, there is a multitude of tasks to be executed by one team with specific expertise. The practice manager is usually interested in a mid-term horizon to understand the demand for his team so resources can be optimally used. In Case 4, the development team looked at the demand from the program (including all attached projects) and proposed the resources assignation for the program for the next phase that was six months long. At the project level, the organizational context imposes a one-year horizon. In Case 2, all projects within the program defined their scope, time, and budget for a year period. At the program level, there is a longer perspective in terms of time. The projects attached to a program are linked together and sequenced to provide an overview of the program overall duration. In Case 4, the program schedule covered more than a year. However, beyond the current budgeting year, the plan had fewer details. Finally, at the roadmap level, there is little mention of the time horizon. It is assumed that the roadmap will extend for more than a year. The focus is primarily on the sequence and integration of the different initiatives and changes required. This aspect of planning was only detected in Case 2. A roadmap of key changes has been built and shared as a prioritized list of opportunities. Each year, the list is reviewed and few opportunities are translated into projects under the program umbrella.

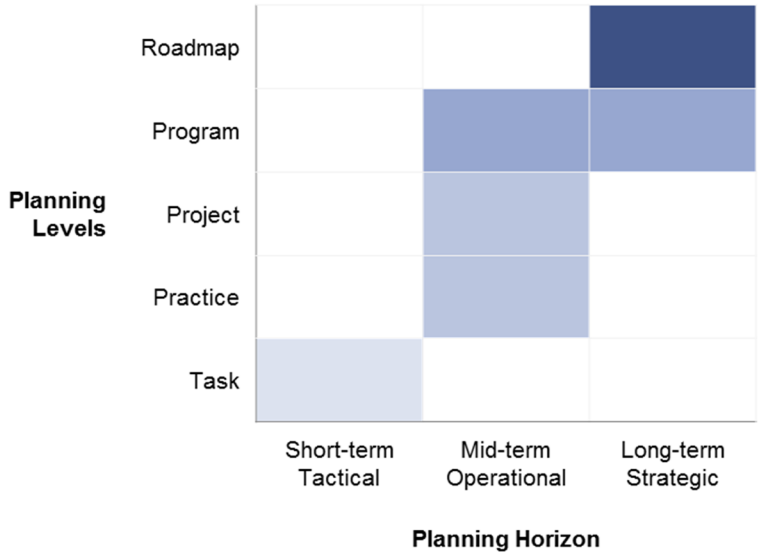

Figure 7-2. Links between planning horizons and levels

7.5 Discussion

The observations from these case studies illustrate elements of conceptual planning in a business transformation context. The elements of design and governance have been identified in the literature. While the elements of rules and guidelines, delivery strategy, horizon, and levels were unnoticeable.

Governance covers both decision-making structure and the team building. A clear definition of who and how decisions are made are prerequisites for effective planning and execution of the transformation initiative. Governance in business transformation appears concerned with internal stakeholders. The project governance literature has a wider extent and more directed to external stakeholders (Brunet, 2018; Derakhshan, Turner et Mancini, 2019; Matinheikki et al., 2016).

Design includes the assessment models and the future state definition indicating that in the context of business transformation, a minimum level of design of the future organization is also required for effective planning and execution of the transformation initiative. In business transformation frameworks, the design is either part of the planning phase (Nightingale et Srinivasan, 2011), or precedes planning as a separate phase or activity (Kettinger et al., 1997). This is equivalent to the choice of a conceptual solution for construction projects (Samset et Volden, 2016).

For engineering and construction, conceptual planning defines the reporting and control guidelines of the project. The current case studies indicate that such rules and guidelines can be expanded to other planning aspects for business transformations. Business transformations have a tight link to the organization's other planning processes. For example, financial planning and demand planning rules will influence how business transformation projects are planned.

For the remaining elements of the delivery strategy, horizon, and levels, the literature is less definite. This may be due to the close link between these elements and the analysis and selection of alternatives for engineering and construction projects. First, the selection of a specific alternative in engineering and construction may have embedded in it the approach of execution to some extent. In business transformation context, these elements seem to have separate importance, further than their link to the chosen future design of the organization. In fact, a specific future design solution can be carried out by different approaches that vary based on how the changes can be introduced to the organization, how the new technologies can be developed, and what are the impacts of each approach on the organization's customers and value delivery. Second, the planning horizon and levels are discussed in project planning literature in relation to hierarchical planning (Dey, Tabucanon et Ogunlana, 1996; Hans et al., 2003). They are not explicitly discussed in conceptual planning literature though. Their emergence in the studied cases may be an indication of the specificity of conceptual planning in the context of business transformation.

It is important to mention that the six elements of conceptual planning identified through these case studies emerged with no specific sequence. In each case, they were executed in different orders. This may also be another characteristic of conceptual planning in business transformation context. The observed elements of conceptual planning do not constitute a sequential process, rather a contingency approach; a conceptual planning capabilities hexagon, where each point can be connected to another with inputs and outputs exchange (see Figure 7-3). Considering the unique nature of each business transformation, even in one organization, a more flexible approach to conceptual planning could be more suited. Nevertheless, flexibility should not be mistaken for the absence of standardization when it is possible. From this study's data, conceptual planning does not seem to be a shared practice in business transformations. This situation may be compared to the early development of conceptual planning in construction. CII encourages each organization in the industry to first adapt the proposed process, then to standardize it (Construction Industry Institute, 1995).

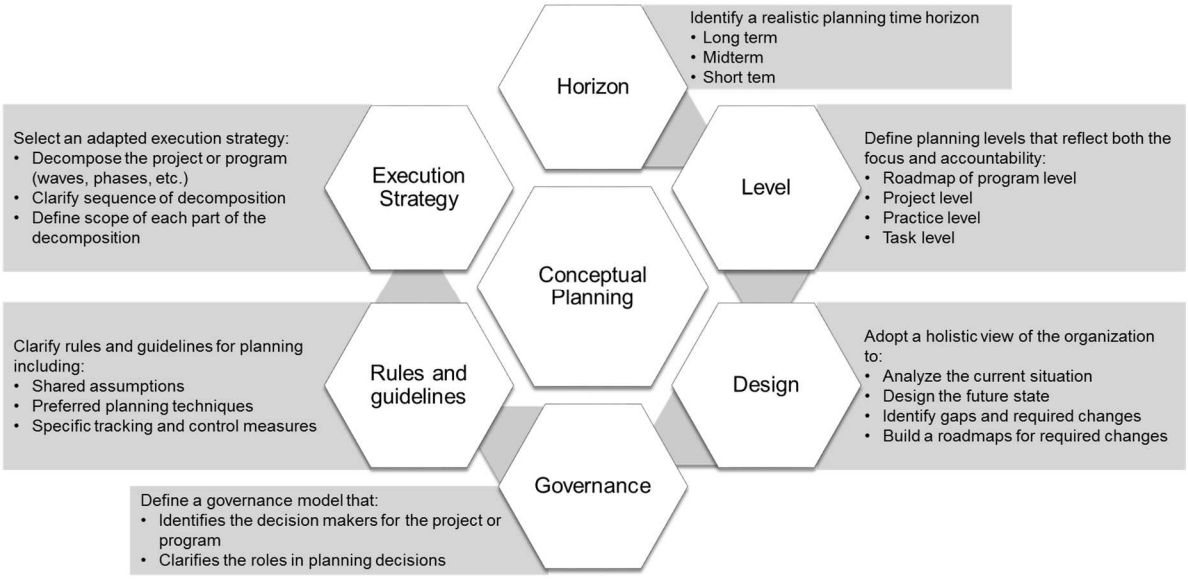

Figure 7-3. Elements of conceptual planning in business transformation context

7.6 Conclusion

Using a multiple case study approach, this article explored the aspects of conceptual planning in the context of business transformation projects. The data confirms the use of some conceptual planning elements in existing business transformation frameworks. It highlights potential aspects of conceptual planning that can be specific to business transformations.

The value and process of conceptual planning have been proven for engineering and construction projects. This article contributes to the exploration of extending conceptual planning to other projects' contexts, specifically business transformation. The shared characteristics of projects in terms of complexity and uncertainty warrant further research on the subject. In addition, this article adds to the growing literature arguing the need for project management practices adaptation to different projects' categories and contexts.

For future research, two directions can be explored. First, expanding this study's context to include other organizations and other business transformation projects, will help generalize the findings on conceptual planning and validate the need for its application in such projects. Second, as it was done for other projects' categories, an evaluation of the correlation between projects' success and the application of conceptual planning practices can be performed and should encourage practitioners to leverage such practices in their organizations.

CHAPITRE 8 ARTICLE 4: DIMENSIONS AND REQUIREMENTS OF COLLABORATIVE PLANNING IN BUSINESS TRANSFORMATION PROJECTS

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Abstract

Collaborative planning has proven to be effective in areas where complex problems are linked to multiple stakeholders and entities, like urban planning, military, and supply chain management. In project management, however, the concept has been less present, and few studies have explored its implications for an improved project planning process. This article uses a qualitative multiple case studies approach to explore the dimension and requirements of collaborative planning for business transformation projects. Two dimensions are identified: planning for collaboration and planning in collaboration. A set of requirements are also identified to enable both dimensions of collaborative planning.

Keywords: Project Management, Collaboration, Planning, Business Transformation

8.1 Introduction

Business transformations are defined as complex and large change projects in organizations that alter how work is done and how value is delivered (Purchase et al., 2011). Different studies show a high failure rate of such projects ranging from 40 to 70 percent (McKinsey, 2008b; Nohria et Beer, 2000). Business transformations deal with a multitude of internal and external relationships that have a direct influence on their success. Hence, planning and collaboration of business transformations are two key success factors.

In other fields of study, like supply chain management, collaborative planning has been proposed and used as a planning approach for a collaborative context. It is a set of processes and guidelines that facilitate the collaboration between involved parties to build a plan that is mutually beneficial (Kilger et Reuter, 2005). As mechanisms of information exchange and co-decision-making are developed, collaborative planning raises the level of engagement between collaborating entities and enhances the quality of the resulting plans.

Meanwhile, the development of collaborative planning for project management has been limited and for the few studies that address it, they have been specific to engineering and construction type of projects (Shelbourn et al., 2005, 2007). The increasing collaborative nature of projects requires a closer look at the nature of links between collaboration and planning. And as the majority of studies focus on engineering and construction projects, the exploration of other projects' contexts would enrich the understanding of such practices and its requirement (Besner et Hobbs, 2013).

This article attempts to address this gap in the project management literature by exploring the nature of collaborative planning in the context of business transformation projects. Using a multiple case studies approach, it identifies the links between collaboration and planning and describes some of the requirements for an effective collaboration in project planning processes.

The remainder of this article begins with a literature review of collaboration in projects, specifically collaborative planning. A summary of the research approach will follow, where an overview of the cases data and organizational context will be presented. Observations on collaboration will first be described. Then collaborative planning specifics and characteristics will be illustrated. Finally, these results will be discussed in relations to the literature and relative to this study's limitations.

8.2 Literature Review

8.2.1 Collaboration in projects

The need for collaboration in organizations is increasing and stems from the inability of a single entity to solve complex problems across multiple other entities (Gray, 1985). Whether it is intra-organization or inter-organization, collaboration requires effort and resources to facilitate it and ensure its effectiveness (Huxham et Vangen, 2005). Research on managing collaboration covers software and tools for collaborative work (Kurbel, 1994; Schmidt et Bannon, 1992), as well as organizational conditions and factors to facilitate it (Gray, 1985; Thomson, 2001).

Projects are microcosms of organizational relationships and dependencies between different organizational units to deliver goods and services. As such, projects are becoming inherently collaborative as they bring together multiple disciplines and different organizations (Emmitt, 2010). Collaboration in projects has challenges around the proximity of teams (Bourgault et Daoudi, 2014; Knoben et Oerlemans, 2006), multi-disciplinary teams (Emmitt, 2010), collaborative tools and information systems (Kerzner, 2015; I.-C. Wu et Hsieh, 2012). Even though other categories of projects have been identified (Archibald, 2013), the majority of studies on project collaboration have been for engineering and construction, and information technology (IT) projects (Dietrich et al., 2010; Wells, 2012).

In business transformation context, the changes required in organizations require solutions that involve customers and multiple stakeholders internally and externally (Purchase et al., 2011).

Collaboration has then an important impact on business transformation projects. Collaboration is necessary to maximize the impact of any transformational effort (Nightingale et Srinivasan, 2011). In a global study conducted by McKinsey, collaboration across organizations was identified as a factor for successful transformations (McKinsey, 2008b).

Nevertheless, the integration of collaboration in business transformation frameworks is minimal. Most of the proposed business transformation frameworks focus on a descriptive approach (Kettinger et al., 1997; Nightingale et Srinivasan, 2011) or a capability-based methodology (Uhl et Gollenia, 2013). The collaboration is identified in various forms as a component to be considered through stakeholders' analysis or change impact evaluation. Collaboration in business transformation literature is not discussed as a different approach to organize and execute projects. More specifically, the links between collaboration and planning are not explored.

8.2.2 Collaborative planning

The challenges of complex situations with multiple stakeholders are also found in other fields like military planning and supply chain management (Dudek et Stadtler, 2005; Mccauley, 2011). In these areas of study, the concept of collaborative planning has been introduced as a planning approach that integrates the need to collaborate between various entities and ensure both engagement and planning quality.

For the supply chain, collaborative planning is defined as a process for co-decision-making where two or more partners align their individual plans, coordinate their efforts, and optimize the results of the supply chain (Stadtler, 2009). Each partner in the supply chain represents a planning domain, and the objective of collaborative planning is to define a common planning domain across all partners with a globally optimized solution (Kilger et al., 2008). Collaborative planning approaches are influenced by the structure of the supply chain and the dynamics of its relationships. In addition, collaborative planning has challenges with the uniqueness of each partner's specific information and decision-making process (Azevedo et al., 2005), as well as human factors related to processes and practices like negotiation (Stadtler et Kilger, 2008).

In military studies, collaborative planning is also referred to as joint military planning. The nature of military interventions has evolved influencing the nature of partners and stakeholders involved, and the type of planning approaches required to achieve the targeted military results (Mccauley,

2011). Here again, collaborative planning faces challenges of human and organizational nature that can have implications on the processes and technologies supporting military decision-making (McKerney, 2000).

Collaborative planning is then a potential solution in complex situations where multiple entities must interact to build a shared plan, make decisions and coordinate efforts. The values and challenges of such an approach have been explored in supply chain management and military, as well as in urban planning. Few studies have been concerned with collaborative planning for projects.

One stream of research has focused on the development of collaborative tools and software for project work (Knotts et al., 1998; Kurbel, 1994; Ren et al., 2006). In such works, the authors focus on the tools required for a collaboration to be effective during the project. Another research focus has been on the planning of collaboration as an effort and an attribute of project work. Shelbourn et al., (2007) propose a framework to capture and implement collaboration requirements for construction projects. Walter and Scholz (2007) explore the success factors for planning collaboration for urban transport projects.

The literature on collaborative planning in project management has addressed the technological requirements of collaboration and the consideration of collaboration as an important factor to take into account during project planning. Contrarily to other research fields, in project management, the integration of collaboration in the planning process has not been explored yet. In addition, the majority of studies are for construction and infrastructure type of projects. Other categories of projects also require exploration of their characteristics (Archibald, 2013), and consideration of adapting project management practices to their context (Besner et Hobbs, 2013; Niknazar et Bourgault, 2017). There is then a gap in the project management literature about the nature of the links between planning and collaboration, as well as the exploration of other projects contexts than engineering and construction.

In summary, collaboration is an inherent nature of projects. The links between planning and collaboration have increased the quality of plans in fields like supply chain management. However, in project management research, few studies have explored collaborative planning. For business transformations, the extent of collaboration and its importance to projects' success warrants an exploration of collaborative planning in such a context.

8.3 Research Methodology

As the objective is to explore the nature and requirements of collaborative planning for business transformation projects, a case study approach is suited (Yin, 2014). And as business transformation is a sensitive subject for organizations to share intimate knowledge about, the focus was first to partner with a company willing to share such information and where multiple cases of business transformations can be found. Once an industrial partnership was established, an embedded multiple case study was conducted (Noor, 2008; Yin, 2014). Such an approach provides an in-depth understanding of how a phenomenon takes place in the organization by comparing multiple cases. In this study, the interest is in the context of business transformation and how such initiatives were planned.

Four business transformation initiatives were selected with the help of an internal team within the industrial partner's organization. The cases were selected based on the scope and relative impact of the change to the organization, as well as data availability and accessibility. The data collection revolved around in-depth interviews with participants in each case. This initial set of data was then complemented by a selection of documentation available for each case. To support the understanding and interpretation of the data, some general organizational context documentation was gathered. The four cases selected for this study can be summarized in Table 8-1. The overall data collection was spread from October 2015 until June 2016 and the cases covered a period of six years from 2010 until 2016.

The selected data was then analyzed using a thematic data analysis approach that codifies qualitative data and groups it into themes (V. Braun et Clarke, 2006). Nvivo 12 was used as a qualitative data analysis software to support the collection, structure, coding, and analysis of the different data sources (Bazeley et Jackson, 2013). A case-by-case analysis was performed followed by a cross-case analysis (Eisenhardt, 1989; Krippendorff, 2004; Yin, 2014).

Table 8-1. Summary of cases data sets

Case	Description	Number of interviews participants	Interviews total duration (min)	Number of documents selected
Case 1	It is a project at a departmental level that aimed to re-engineer a process end-to-end with the implementation of a new information system. The project was considered a success by all stakeholders as it finished on time, under budget and delivered the business results expected.	6	516	120
Case 2	It is a company-wide program that was initiated by the CEO to change the organizational culture and put more focus on customer service excellence. The program included projects that did teams' organizational design, processes reengineering, and information technology changes. The overall program benefits were considered achieved, even if some projects under it were considered failures by their stakeholders.	4	293	43
Case 3	It is a project at a departmental level that aimed to redesign how the department manages and executes on demand and opportunities. No information system changes were introduced. However, changes in behavior and mindset were considered high for employees. At the moment of data collection, this project just started its delivery or execution phase.	4	344	51
Case 4	It is a program that aimed to implement or enhance multiple new information systems for one business area of the company. The program had 5 information technology projects. The program overall was considered a failure by all stakeholders that translated into a financial right off to overcome its costs at its closing.	5	465	120
Context	General information about the organizational context and the links between different business transformation initiatives.	2	131	16
	Total	**21**	**1749**	**350**

8.4 Results

Using the thematic analysis codification of the case studies, the findings will be presented in two groups:

1. *Collaboration in projects* synthesizes observations about collaboration in all aspects of the project's delivery; and
2. *Collaboration and planning* regroups observations about specific links between collaboration and planning.

8.4.1 Collaboration in projects

The literature on collaboration raises the challenges to reach a common definition of collaboration. Interviews' participants were asked to define collaboration and provide indications of its manifestation in their projects.

Participants' definition of collaboration varied. Some consider collaboration an equivalent to teamwork and an esprit de corps that builds in the project team. Others define it in terms of the amount and quality of information exchanged during the project for each member to effectively execute their activities. And others make co-decision-making the focus of collaboration.

These different definitions of collaboration vary between cases, but also within each case. In Case 4, the business lead sees collaboration as the intensity of involvement in making decisions affecting the project. While the IT technical lead emphasizes the importance of efficient information sharing tools and mechanisms.

Despite this variation in collaboration definition, the data indicates some shared factors of effective collaboration. They are applicable to all phases and processes of the projects. Two enablers of collaboration are the most recurrent across cases:

1. Leadership buy-in and commitment: leaders and decision makers approve and stress the need for collaboration during the project. Leaders not only communicate their encouragement for the project team to collaborate but commit time and resources for required collaborative activities. They also display collaborative behavior. In Case 1, the project sponsor held various sessions with his direct reports and key stakeholders in the project to share his vision for the project and encourage everyone to collaborate with the

project team. In steering committee meetings, he would display an openness to debate that was perceived as an embodiment of collaboration.

2. Sustain stakeholders' engagement: keep participants in the project engaged with its activities and decisions. Most stakeholders have other priorities and usually, drift away from the project and its progress. The project team needs to actively seek to involve such stakeholders and keep them engaged throughout the project. In Case 2, the program team established routines to share progress and reach out to various stakeholders in the organization. They frequently met with executives in different departments to share the program objectives, and discuss in detail the impacts on their teams. This team has also used formal communication channels to announce key decisions and major milestones. And most importantly, the program sponsor, the CEO, personally reached out to different levels of the organization to get updates on progress and engage employees in the program's goals.

It is also important to link these collaboration enablers and requirements with the overall organizational context. During the period of data collection and analysis with the organization of study, two CEOs took the leadership. And both shared a commitment to increase the level of collaboration within the organization. They used messages like "cross-functional efforts", "acting as one team", and "huddle like rugby teams". It is recognized that the organization suffers from silos work, and many initiatives have challenges delivering results partly because of the lack of collaboration intra-organization. Such challenges are mostly visible in cross-departmental projects such as business transformations. There is an influence of this organizational context and culture of collaboration on how teams and participants collaborate during business transformations. In Case 1 and Case 3, the animosities between the IT department and other business groups created few roadblocks for the leaders in the way to establish a collaborative atmosphere.

In summary, collaboration is defined differently between cases and even between participants within each case. Across cases, collaboration is mostly equated to teamwork, information exchange or co-decision-making. Notwithstanding the difference in the perception of what collaboration is, two success factors have been identified. Leadership and sustaining engagement are recognized as crucial for effective collaboration for projects.

8.4.2 Collaborative Planning

When analyzing data about collaborative planning, both a directed codification and an exploratory review were conducted (V. Braun et Clarke, 2006). It allowed for the discovery of two dimensions of collaborative planning:

1) Planning for collaboration : data and observations pointing to collaboration as a cost for business transformation projects. Here collaboration is a subject of planning. Either considered as an effort or resources, collaboration should be planned for and taken into account.
2) Planning in collaboration : data and observations describing what collaboration during project planning looks like. Here collaboration is an attribute of the planning process that contributes to the generation of better and more engaging plans.

8.4.2.1 Planning for collaboration

For all cases, interviews' participants identify collaboration as an additional cost to their projects. They describe it as a need for specific resources or an additional effort associated with collaborative activities. In all cases, members of the projects' teams are identified as facilitators of collaboration for the duration of the projects. These roles are generally described as "teams' coordination" or "integration". In Case 4, two of the interviews' participants described their roles in the program as integrators between business and IT teams. They define their efforts as "pulling people together to accomplish activities in the program". In other words, they see their roles as custodians of collaborative work between teams involved in the program. In Case 1, process design workshops took longer than estimated. The project team and participants in those workshops put additional hours on the project to meet deadlines. It translated into additional costs associated with those activities.

Despite this recognition of collaboration impact on projects' resources and efforts, explicit consideration of collaborative effort during planning was found in two out of the four cases.

In Case 2, the program team assessed the expected level of collaboration for each project within the program and planned in consequence. Mainly through meetings with team managers, they would evaluate the work intensity required for the project, as well as potential collaborative work

or challenges. A member of this team summarized the idea by: *"You get a sense early on that this might have a challenge here, so you plan the consequence." Case 2 Program Manager*.

In Case 3, process design workshops represented an important portion of the project's activities and were the driving element for schedule duration. The project manager leveraged the business teams' representative to evaluate the difficulty of subjects to be discussed during each workshop and determine the number of participants. She then used this information to estimate the workshops' duration by embedding the "time required for debates and discussions". And in her opinion, this is how she took into consideration the impact of collaboration on the project's overall effort.

In both cases, the evaluation of collaborative efforts required for the projects takes place during planning. And it is based on an assessment of the projects' participants and audiences. In many aspects, it is very similar to an audience and impact analysis performed for change management purposes. To understand the level of collaboration required, a proxy can be used to estimate the effort required. In workshop intensive projects, the expected level of conflict and debate can indicate the additional effort required for collaboration. In Case 3, the project manager considered conflict one of the indication of a healthy collaboration: *"A collaborative team is one that argues all the time. There's a lot of conflict in a collaborative team. If there's no conflict, they're not collaborative." Case 3 Project Manager*.

Collaboration is also recognized by participants as a work dynamic. For it to be effective, it requires preparation during project planning. Elements like establishing trust and engaging project team members require front-end build up. In Case 1, the project team was composed of members from three departments. At first, they were misaligned and were not able to collaborate fully. *"Those three teams didn't necessarily work together prior to this type of project, so it was always disconnected." Change Management Specialist 1 in Case 1*. Then, with time, the team started to build trust and work together in a collaborative manner. *"It was a challenge to start. I think as the project progressed, they became one team with the same goals working at the same pace" Change Management Specialist 2 in Case 1*.

8.4.2.2 Planning in collaboration

The value of planning in collaboration is described by interviews' participants in two ways. First, it guarantees the engagement of the project team and its ownership of the project plan. It ensures a

level of truthfulness in the planning efforts and afterward in their tracking. Planning in collaboration shares the accountability of plan execution. "*Everyone has to agree to the plan of their activity because if I tell someone to do something they will be less accountable for it. If they say I will do it this way, it was their idea, they will be more accountable to it. They need to buy into their plan all the time" Project Manager in Case 2.*

Second, it is a process to empower project participants to make decisions and raise their level of engagement and commitment to the project's results. *"I feel when you involve them in the planning piece, the by-product of that is that you're engaging them right away. You're making them accountable, you're making them part of the plan. They're not just passengers, they're not being told what to do, they're being empowered to make key decisions on this plan." Project Manager in Case 2.*

The case data was analyzed to identify characteristics of the project planning process in collaboration.

Such characteristics can be synthesized as requirements for a collaborative planning process. In the data set, they were identified in relations to three dimensions of collaboration: information exchange, coordination, and co-decision-making. Table 8-2 summarizes these requirements and provides examples from the case studies.

To enable collaboration during project planning, the information exchange shouldn't be one way from participants to the project planner, but also feedback the other direction with clarification of decisions made, and level setting on both the project context and planning approach. In addition, coordination is driven by a facilitative approach that links teams together and integrates otherwise disconnected areas of project planning. All of which should contribute to a more effective co-decision-making where clear governance is defined.

In summary, planning in collaboration is characterized, in these cases, by a set of requirements on information exchange, coordination, and co-decision-making. The value of performing project planning in collaboration is driven by the engagement of project participants and their accountability to the results.

Table 8-2 : Requirements for effective collaboration during project planning

Collaboration Dimension	Requirement	Example
Information Exchange	**Clarify project management processes** to the project team and stakeholders. A specific explanation of how work will be planned and executed should be adapted to the context of the project.	In Case 4, the program team failed to define and share with the associated projects the planning and control process. It led to misalignment on objectives, and in a series of conflicts when monitoring of progress started.
	Share a common vocabulary. Develop and share a glossary of terms and concepts that are key to understanding the project's context, and exchange with other members of the team.	In Case 1, the business analyst built and maintained a glossary of both business terms (specific to the business area impacted by the project) and technical terms (mostly related to software development).
	Level set and train key project participants on the various business and technical areas of the project. Relatively to the project duration, the key participants should be brought to a productive level of knowledge and understanding about the project's business and technical context.	In Case 4, the program team built an introductory material to onboard all program participants on both the business aspects (e.g. processes, concepts) and technical (e.g. software development approach). They held multiple information sessions where this knowledge was shared.
	Train project participants on the planning processes and tools required for the project. Assuming that all participants share the same level of understanding of how planning will be performed, and how to use specific tools is counterproductive. The project leads need to ensure all participants are trained on any process and tool required.	In Case 4, the program team documented the program planning and control guidelines and organized information sessions with all projects teams to share them.
	Summarize and share key decisions with the project team and any team or group that may be impacted. Share information with potentially impacted teams or groups, even with preliminary information, allows them to be prepared and plan well ahead of time when the change is expected.	In Case 1, the project team started sharing key decisions from the project's design with IT teams so they are prepared to support the project and the future information system as well.

Table 8 2 : Requirements for effective collaboration during project planning (Cont'd)

Collaboration Dimension	Requirement	Example
	Leverage a structured documentation management and sharing platform.	In this organization, SharePoint is the collaborative platform of choice. Almost any project would have a SharePoint site to share documents and communicate with wider audiences.
Coordination	**Favor and facilitate in person communications and discussions.** The proximity increases the level of collaboration and is perceived to be more engaging.	In Case 1 and Case 3, the teams were encouraged to meet in person and were provided dedicated space like "war rooms".
	Facilitate cross-teams problem-solving. It helps build cohesion in the project team that transcends the organizational silos and brings all assigned resources to think as one team.	In Case 1, team members helped each other solve problems on the project outside of individual responsibilities and tasks.
	Assign and clearly identify resources responsible for coordination. Resources that will actively integrate the various teams, and project-specific elements (e.g. processes, technology)	In Case 4, the program had an assigned IT integration lead that ensured the coordination between different IT aspects. Also, the business analyst acted as a coordinator and facilitator between teams.
Co-decision-making	**Implement a governance model for decision-making early during planning.** Planning includes a series of decisions that rely on governance for effective decision-making.	In Case 1, the project governance was defined before planning started. It allowed the early involvement of the steering committee in planning decisions.
	Document and track planning decisions. Decisions can be lost in translation in planning. Proper documentation and tracking guarantee a minimal amount of consistency.	In Case 4, planning decisions were not documented. It led the program team to lose perspective on why specific decisions were taken. The consequences were in the likes of rework to reach the same decision or contradictory actions.

Table 8 2 : Requirements for effective collaboration during project planning (Cont'd and end)

Collaboration Dimension	Requirement	Example
	Facilitate discussions and feedback about planning decisions. Planning decisions should rally all impacted teams. Which requires a high level of interaction, both inputs, and feedback that will alter and improve the plan to maximize such teams' engagement**.**	In Case 3, the project manager acted as a facilitator in planning discussions with the steering committee and the project team.
	For critical decisions, specify a clear process for decision-making. In some projects, there may be similarities in the decisions required. Defining a clear process on how inputs should be presented, what criteria to use and how to select the decision helps to improve the planning quality.	In Case 1, software customization was expected and the objective was to minimize it. The IT architecture team defined a process detailing how each request for customization will be evaluated and prioritized, with different levels of escalation when required.
	Define guidelines or principles for decision-making relevant to the project's context. These guidelines help project participants and collaborators during planning on reaching faster decisions by sharing the same criteria of evaluation.	In Case 2, the core team defined a list of program principles that each project should follow when initiating and planning.
	Ensure all decision makers consult the same facts for a decision and they understand it the same. In a transformation context, most planning decisions lack data and facts. The few inputs available should be optimized by decision makers.	In Case 3, the business lead would meet the steering committee members individually before each committee session to ensure they consulted the prepared inputs for decisions, and clarify any misunderstanding.

8.5 Discussion

The results from interviews about perceptions and definitions of collaboration are in line with the findings in the literature. Other studies have shown the difficulty to align collaborators on a unique and shared definition of collaboration (Gray et Wood, 1991; Huxham et Vangen, 2005).

The success factors and requirements for effective collaboration are also very similar to what was identified in the literature. Furthermore, the success factors identified in this research's context are solely for organizational dimensions. Compared to the literature, where other factors linked to

technological tools and business processes have been identified (Kerzner, 2015), this study's context seems to be focused only on organizational needs. The company's challenges with collaborative work may explain such a focus.

As in these cases, collaboration can't be pinned to one definition, expectations for a collaborative project will vary between stakeholders. This adds to the difficulties of conducting business transformation projects. One avenue of solutions could reside in raising the collaborative organizational culture and that would translate into more collaborative projects. Another would be to build collaboration in project management processes to ensure it takes place, it is effective, and it is adaptable to the varying expectations. The latter solution has been explored in the literature through "collaboration engineering", where different techniques to build collaboration processes are discussed in relations to other business practices (de Vreede et Briggs, 2005; Kamrani et Nasr, 2008). Still, and as indicated by the cases studied, it can be argued that collaboration in business transformation projects is highly dependent on the overall organizational collaborative culture. This may lead some practitioners to postpone business transformations until a more mature organization is ready to execute it. However, the premise and value of business transformations are to change how the organization works (Pellegrinelli et Murray-Webster, 2011). Which makes waiting for change to take place counterproductive. Another important factor of influence is the leadership of the projects (Lundy et Morin, 2013). The results indicate an important role for coordination and integration. It calls for leadership skills like facilitation and influence (Globerson et Zwikael, 2002).

The findings from these case studies indicate that collaboration is a cost for business transformation projects. The literature on collaboration concurs with this result. Collaboration is a cost for organizations, and not managing it may be proved to be expensive (Cropper, Huxham, Ebers et Ring, 2008). In business transformation projects, this cost can be planned for as an impact on the duration of collaborative activities, or as an additional cost of resources to facilitate collaborative work. And looking at project delivery measures of scope, schedule and cost, the scope element is not represented in the data at hand. Collaboration seems to be taken into account as a cost and impact on schedule, but there is no indication of how it impacts the scope of work.

Most references on project management emphasize the importance of communication and information sharing for a successful delivery (International Project Management Association,

2015; Office Of Government Commerce, 2009; Project Management Institute, 2017). In this organization's case studies, the information exchange alone has proven to be ineffective. Most employees are busy and business transformations are generally considered on top of day-to-day activities. People are either flooded with information and do not check it, or they are distracted. It puts the burden of sharing and level setting the information on the project team (e.g. manager, business lead, planner, etc.).

Collaborative planning has also an integration component with the overall business plan of the organization. Decision makers are influenced by other business objectives and pressures of the overall organization, not only by the project. The project deliverables are linked to business results that the management team is accountable to achieve (Patanakul et Shenhar, 2012). A project planning process should integrate with the overall business plan, and align expectations.

Planning in collaboration can be a selective approach to be used when conditions are favorable and participants are responsive. Otherwise, it would be counterproductive by breaking trust in the project team and disengaging its members. The requirements for effective collaboration during the planning process are defined separately from the planning process itself. To facilitate the integration of these requirements to the planning process, leveraging Engineering collaboration could a potential avenue. In addition, theoretical concepts of collaborative planning, like planning entity or unit, have been used in other fields of research. These concepts were not identified with the explorative research used to analyze these case studies. They may be opportunities to continue the theoretical development of collaborative planning for project management. As well as, they can be used to propose new models for project planning where collaborative requirements are embedded.

8.6 Conclusion

In supply chain management and military planning, collaborative planning has been developed as a planning approach to address collaborative situations with complex problems and relationships. The literature in project management has limited coverage of this concept and the few references on the subject are specific to engineering and construction contexts. This article focused on the context of business transformations. Using multiple case studies, this study analyzes the characteristics and requirements of collaborative planning in a specific organizational context. The

results point to two dimensions of collaborative planning. The first is the consideration of collaboration as a project cost during planning. Collaboration is an object of planning for business transformation projects. The second is the integration of collaboration as an attribute of the planning efforts. Collaboration is represented as a set of requirements to be embedded into business transformation planning processes.

The first contribution of this article is methodological, as the use of qualitative multiple case studies is leveraged to explore a concept in a specific organizational context for business transformations. Then, the exploration of the dimensions of collaborative planning provides a starting point for further research that can transpose approaches and findings from other research fields to project management. Furthermore, the identification of collaborative planning requirements can be used to propose a new model of project planning for business transformations that integrates collaboration in the planning processes. Finally, the findings discussed in this article are still limited to the organizational context of this study. Any generalization of these results requires a more extensive coverage of other organizations and more business transformation cases.

CHAPITRE 9 DISCUSSION GÉNÉRALE

Dans les chapitres 5 à 8, les résultats de cette recherche ont été présentés et discutés en lien avec les sujets spécifiques qu'ils traitent. Dans ce chapitre, la discussion portera sur deux éléments communs aux quatre articles. Il débutera par discuter l'impact de la contextualisation sur les efforts de développements des théories et pratiques de gestion de projets. Puis, une évaluation des liens entre la maturité des processus de la planification et la collaboration sera exposée. Le chapitre traitera aussi des contributions scientifiques de ce travail de recherche. Il sera conclu par une revue des limitations de recherche et les avenues de recherches futures.

9.1 Impacts de la contextualisation des projets

Un des thèmes directeurs de cette étude est la contextualisation des pratiques en gestion de projets. Dans l'article 1, le contexte organisationnel a dicté les paramètres d'adaptation du cadre de transformation d'affaires. Les articles 2 et 3 explorent les pratiques de planification spécifiquement pour le contexte qu'offre la transformation d'affaire comme une catégorie de projets. L'article 4 identifie les dimensions et exigences de la collaboration, encore pour le contexte des transformations d'affaires. L'influence du contexte sur les pratiques et leur compréhension a été discutée dans la littérature. Les résultats de cette recherche invitent la réflexion sur les différentes approches de développement de théories et de pratiques pour le contexte étudié.

Chaque projet est unique et requiert une mise en contexte qui donnerait justice à ces spécificités (Shenhar, 2001). Ceci dit, le développement de pratiques spécifiques pour chaque projet serait irréaliste. Les efforts de recherche dans le domaine ont donc convergé vers la généralisation à la recherche de standards et de partage des bonnes pratiques. Une direction alternative de recherche serait de considérer des développements de pratiques selon les contextes des projets (Dov Dvir, Shenhar, et al., 2003; Shenhar et Dvir, 1996).

La prise en compte de la contextualisation peut se traduire en différentes approches de développement des pratiques en gestion de projets. La Figure 9-1 résume les trois approches suggérées de développement en lien avec deux critères de sélection. Le premier critère est le degré de différence entre les contextes de projets. Le développement des pratiques de gestion de projets serait moins demandant si les contextes de comparaison partagent certaines caractéristiques clés; comme la nature du produit à livrer par les projets et la nature des organisations permanentes qui

interagissent au cours du projet. Par exemple, les projets de construction d'infrastructure routière seraient plus proches des projets de construction d'immeubles qu'ils le seraient des projets des technologies d'information. Le deuxième critère est l'efficacité de l'effort de développement qui tient compte de la complexité du travail de recherche et aussi la quantité d'effort requise. Ce critère évalue la fine balance entre l'effort requis pour avoir des pratiques complètement faites sur mesure au contexte du projet, et les résultats ou bénéfices à réaliser. Par exemple, concevoir une nouvelle technique de contrôle des coûts pour des projets d'installation d'infrastructures de télécommunications ne serait pas l'option la plus rentable si des techniques existent pour des projets très semblables comme l'installation de réseaux électriques ou de pipeline.

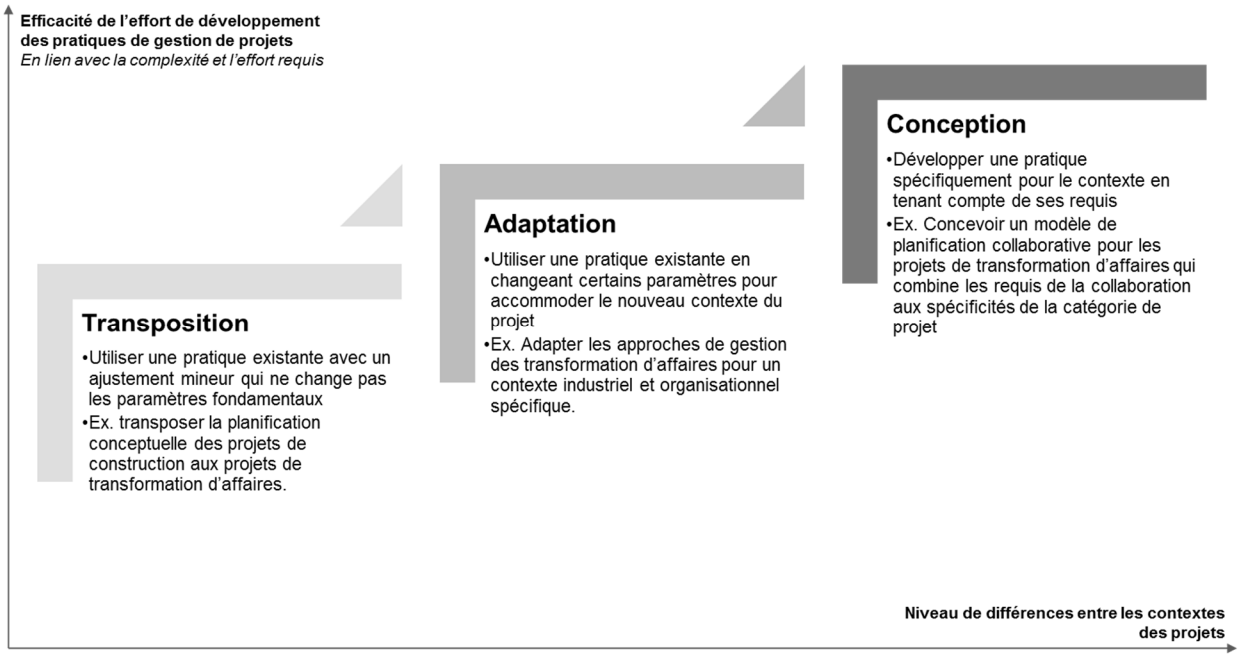

Figure 9-1. Approches de développements dans la contextualisation des projets

Les trois approches de développement varient d'une transposition d'un contexte vers un autre partageant des similitudes, à une conception plus centrée sur le contexte visé. *La transposition* est l'approche la moins coûteuse en effort et la moins complexe. Elle peut s'appliquer en utilisant des pratiques assez matures et testées dans un contexte de projets, vers un autre où c'est moins présent. Comme détaillé dans l'article 3, la transposition des pratiques de la planification conceptuelle des projets de construction aux projets de transformation d'affaires est un exemple. *L'adaptation* est une approche de compromis qui vise à transposer des pratiques d'un contexte mature, mais en effectuant des modifications pour les adapter au contexte ciblé. L'adaptation aux contextes

organisationnels est utilisée dans la littérature (P. W. G. Morris et Geraldi, 2011; Shenhar et al., 2005), et dont l'article 1 fournit un autre exemple. Finalement, *la conception* est l'approche la plus coûteuse, mais aussi la plus dédiée au contexte cible. Les pratiques de gestion de projets sont complètement revues pour une conception spécifique au contexte cible. L'article 4 contribue à l'utilisation de cette approche pour concevoir un modèle de planification collaborative des projets de transformation d'affaires.

Pour résumer, une analogie avec l'implantation des systèmes d'information peut être utilisée. La transposition correspond à l'implantation de la version standard ou « vanille » d'un système donné. L'adaptation correspond à une implantation accompagnée de configurations spécifiques du système. Et la conception correspond à la personnalisation du système ou « customisation ».

9.2 Liens entre la maturité des processus et de la collaboration

En lien avec la contextualisation des projets, l'influence de la maturité organisationnelle a été aussi un élément commun à travers les résultats identifiés dans cette étude. L'article 1 indique que l'évaluation de la maturité de l'organisation est un prérequis pour la réussite des transformations d'affaires. L'article 2 discute de l'influence des pratiques organisationnelles sur la planification des projets étudiés. Il indique un lien entre la maturité de ces pratiques et l'évolution et la standardisation des processus de planification des projets. L'article 3 mentionne que la planification conceptuelle est une pratique de gestion de projets mature dans l'industrie de la construction. Mais, elle n'est pas au même niveau de maturité pour les projets de transformation d'affaires. De la revue de littérature il est indiqué que la collaboration reflète à certain égard la maturité des relations entre les parties prenantes surtout dans un contexte interorganisationnel. Ceci suscite un questionnement sur les liens entre la maturité des processus de planification et celle de la collaboration.

L'idée d'utiliser un modèle de maturité pour guider l'amélioration d'une pratique ou d'une organisation a été initiée par le concept de *Capability Maturity Model* (CMM) originalement exposée dans le travail de Paulk, Curtis, Chrissis et Weber (1993). Dans la transformation d'affaires, les modèles de maturité peuvent être utilisés pour guider l'évaluation d'une organisation et guider les changements requis (Kulpa et Johnson, 2008; Nightingale et Mize, 2002). En gestion de projets, différents modèles de maturité ont été suggérés pour accompagner les organisations à

améliorer les pratiques de gestion de projets et mieux les intégrer avec leurs agendas stratégiques (Kerzner, 2001). Yazici (2009) indique que l'utilisation d'un modèle de maturité de gestion de projets améliore la performance des organisations. Le modèle le plus reconnu est OPM3 (Organisational Project Management Maturity Model) développé par le PMI (Project Management Institute) (Project Management Institute, 2003). Le modèle contient cinq niveaux de maturité des processus de gestion de projets : initial, répétable, défini, géré, et optimisé (Pennypacker et Grant, 2003). Pour la collaboration, des modèles de maturités sont aussi proposés (Alonso, Martínez de Soria, Orue-Echevarria et Vergara, 2010; Boughzala et de Vreede, 2015). Et spécifiquement en gestion de projets, la hiérarchie de l'effort collaboratif proposé par Nunamaker et al. (2003) est parmi les structures les plus cités. Elle contient trois niveaux de collaboration : collectif, coordonné et concerté.

La planification collaborative lie les processus et pratiques de planification à l'effort collaboratif comme un objet de planification et un attribut des processus. La planification collaborative peut être située comme un état d'évolution à l'intersection de la maturité des processus de planification et le travail collaboratif. En s'inspirant encore du domaine de gestion des chaines logistiques (Montreuil, 2011, 2015), une schématisation de l'évolution de la planification en lien avec la collaboration peut être proposée. La maturité de la planification en tant que processus et pratiques peut être mesurée selon le modèle OPM3 (Project Management Institute, 2003). L'effort collaboratif peut être représenté selon le modèle proposé par Nunamaker et al. (2003). La Figure 9-2 synthétise les niveaux d'évolution proposés.

La maturité des processus de planification est décrite en fonction de trois paramètres identifiés dans la littérature sur la planification collaborative :

1) *L'identification et le type d'entités de planification* : reflète à la fois le niveau d'indépendance à planifier et la complexité de relier les différentes entités.
2) *Les processus et pratiques de planification* : reflètent comment ils sont définis et utilisés dans les entités de planification et entre elles.
3) *Le niveau d'optimisation* : indique l'effort de rechercher des solutions optimales aux différentes décisions de la planification.

La hiérarchie des efforts de collaboration est décrite selon deux composantes :

1) *La dynamique et organisation du travail collaboratif* : décrit comment l'effort de collaboration se manifeste et le degré de gestion qui y est appliquée.

2) *Le degré de coordination* : plus l'effort de collaboration augmente plus les mécanismes de coordination sont importants.

Ainsi les liens entre la planification et la collaboration en gestion de projets évoluent selon quatre niveaux. Le premier état d'évolution peut être décrit comme *fragmenté.* Il correspond à une faible maturité des processus de planification et à un effort collaboratif spontané et non coordonné. Le deuxième état d'évolution peut être qualifié d'*intégré*. À ce niveau, les entités de planification sont localement identifiées et les processus sont standardisés visant un plan local optimal. C'est un niveau auquel le travail collaboratif est coordonné autour des livrables clés. L'état *collaboratif* est le troisième état d'évolution. Il inclut des entités de planification locales et globales formalisées. Les processus sont définis au niveau des organisations et l'optimisation vise une balance entre les domaines locaux de planification et le plan global qui les lient. L'effort collaboratif à cet état est facilité par des cadres de gestion et des outils collaboratifs et la coordination arrime les processus et leurs livrables. L'état *collaboratif* peut être associé à la planification collaborative telle qu'explorée dans cette thèse. Le dernier état d'évolution peut être décrit comme *orchestré.* Il ajoute une dimension d'agilité au niveau *collaboratif*. Les entités locales et globales de planification harmonisent leurs pratiques pour permettre des processus capables de s'adapter aux variabilités et aux incertitudes sans perdre d'efficacité ou réduire la qualité de la solution optimale. En même temps, l'effort collaboratif reste important avec une coordination plus détaillée des activités. L'*orchestration* peut être dirigée par une entité globale de planification.

Cette évolution des liens entre la planification et la collaboration dans les projets peut être décrite avec une analogie à la performance d'un orchestre symphonique. Au début, chaque musicien ajuste son instrument selon une référence absolue ou avec un collègue. Le tout est un ensemble désynchronisé et méconnaissable (*état fragmenté*), mais nécessaire pour préparer la prochaine étape. Par la suite, les musiciens s'alignent par groupe d'instruments. Chaque groupe utilise sa partition avec des indications des interventions des autres groupes. Le tout donne des sons plus arrimés, mais pas tout à fait fluides (*état intégré*). Une fois les partitions de chaque groupe sont annotées par un travail collaboratif facilité par un ou plusieurs musiciens, la symphonie émerge (*état collaboratif*). À ce stade, un orchestre peut performer une symphonie complète. Mais, l'apport

d'un chef d'orchestre (*état orchestré*) en termes de fluidité des transitions, la coordination des groupes de musiciens et même des individus élève la qualité de la performance musicale (Kumar et Morrison, 2016).

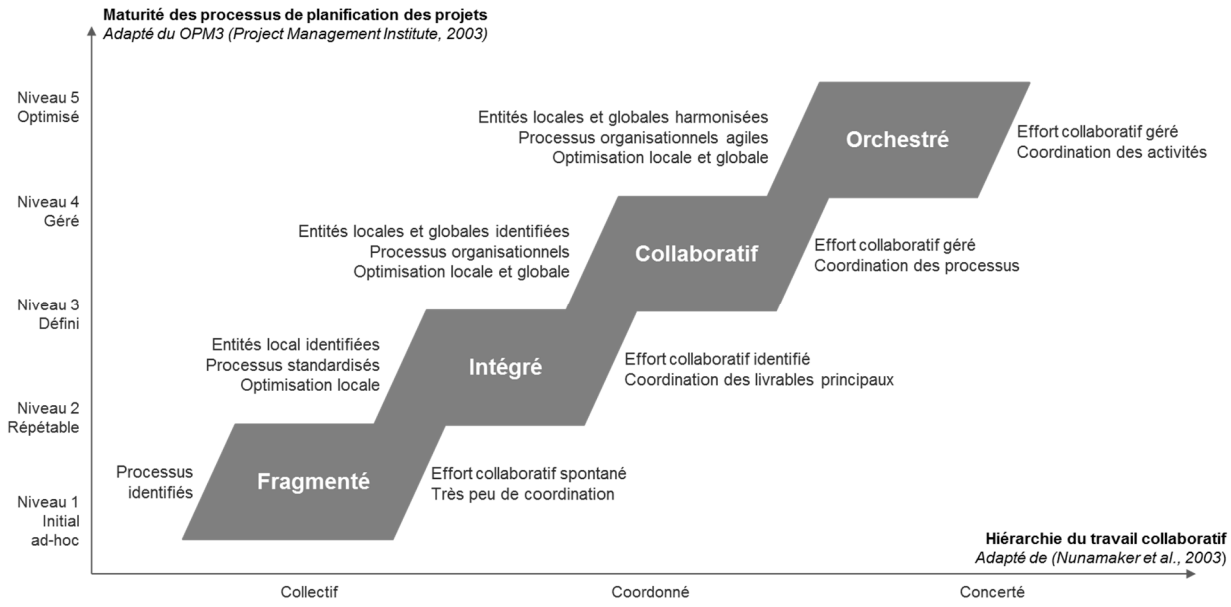

Figure 9-2. Évolution de la planification en lien avec la collaboration en gestion de projets

9.3 Contributions théoriques et pratiques

Les contributions de cette étude seront discutées selon trois aspects : théorique, pratique, et méthodologique.

Les contributions théoriques de cette recherche sont :

1. **Utiliser le contexte des projets de transformation d'affaires** : les études en gestion de projets, et spécifiquement en planification, sont en majorité pour les projets en ingénierie et construction et les technologies de l'information (Serrador, 2015). Les autres catégories de projets ont été moins étudiées. Cette thèse utilise le contexte de la transformation d'affaires qui est encore moins exploré dans la littérature en gestion de projets (Cha et al., 2018). Cette catégorie de projets acquiert une importance croissante pour les organisations, car elles déterminent dans plusieurs cas leurs survies dans leurs marchés. Ces projets se caractérisent par le niveau élevé de risque et de complexité qui proviennent, entre autre, de la nature des relations entre les parties prenantes et les défis de leur gestion. Cette étude contribue donc à enrichir la littérature en gestion de projets qui utilisent des contextes

différents, et souligne la richesse que tels contextes offrent pour une compréhension plus fine des théories et pratiques de la gestion des projets (Niknazar et Bourgault, 2017).

2. **Proposer une adaptation d'un cadre de transformation d'affaires** : dans la littérature sur les cadres et approches de transformation d'affaires, il est souvent recommandé d'adapter les méthodologies et techniques proposées au contexte de l'organisation. Cependant, les paramètres d'adaptation du cadre générique restent absents. L'article 1 de cette thèse propose quelques paramètres d'adaptation qui ont été appliqués avec le partenaire industriel pour développer un cadre de transformation d'affaires adapté à son contexte. En lien avec les défis de la contextualisation des projets, l'article 1 propose un exemple d'approche d'adaptation qui utilise la littérature existante et définit des paramètres organisationnels d'adaptation.
3. **Adopter une perspective inclusive de la planification des projets collaboratifs** : la littérature qui traite de la collaboration en lien avec la planification utilise souvent une activité ou un processus spécifique comme le design ou l'ordonnancement. Cette recherche a adopté une perspective plus inclusive de la planification qui a visé tous les processus qui peuvent être considérés de planification. Les revues de littérature récentes sur la planification des projets adoptent une définition aussi inclusive de la planification (Serrador, 2015) ce qui permet une couverture plus large des catégories de projets.
4. **Explorer la planification conceptuelle pour les projets de transformation d'affaires** : la planification conceptuelle est parmi les pratiques matures dans les projets à capitaux qui développent des produits ou des systèmes complexes. L'article 3 de cette thèse propose de transposer certains aspects de la planification conceptuelle vers le contexte de la transformation d'affaires. De plus, il indique les particularités de cette pratique dans le contexte des projets de transformation d'affaires. Pour la littérature en transformation d'affaires, ceci enrichit les outils et pratiques d'évaluation et de planification des initiatives de transformation. Pour la littérature sur la contextualisation des projets, ceci offre un exemple concret du type de transposition possible entre deux contextes de projets différents.
5. **Décrire la planification collaborative en gestion de projets** : le concept de planification collaborative est défini comme un processus conjoint de prise de décision entre deux ou plusieurs partenaires afin d'aligner leurs plans individuels, coordonner leurs efforts et

optimiser les résultats globaux (Stadtler, 2009). Cette façon de considérer la planification n'a pas encore été explorée jusqu'à maintenant selon les investigations faites dans cette étude. L'exploration de ce concept a permis de préciser ses dimensions et exigences possibles pour le transposer dans la gestion de projets. Comme plusieurs des pratiques initiales en gestion étaient inspirées de la gestion manufacturière et des opérations (Baldwin et Bordoli, 2014), l'approche de cette étude était d'explorer une pratique mature dans d'autres domaines où la planification est aussi centrale à l'exécution et la réussite, et où les contextes imposent des efforts de collaboration importants; la gestion de la chaine logistique, le militaire, l'urbanisme. L'identification de ses deux dimensions et de ses exigences aide du moins à comprendre comment la planification collaborative se manifeste dans les projets. Ceci peut constituer un premier pas vers une définition plus spécifique et adaptée de la planification collaborative au domaine de la gestion des projets

Les contributions pratiques de cette étude sont :

6. **Sensibiliser à l'importance de l'adaptation au contexte** : à travers cette thèse, l'influence du contexte sur les pratiques de gestion a été soulignée. Pour les gestionnaires en entreprise ou les praticiens en transformation d'affaires, ceci sensibilise à l'importance d'adapter les bonnes pratiques et les cadres méthodologiques à la situation organisationnelle dans laquelle ils opèrent. Cette sensibilisation renforce les indications données dans certains référentiels pour inciter les praticiens à adapter les pratiques et outils à leur réalité (Construction Industry Institute, 1995; Project Management Institute, 2017). L'expérience et les interactions avec des membres du partenaire industriel indiquent qu'un tel effort d'adaptation au contexte n'est pas tout le temps investi.
7. **Valoriser la planification collaborative pour la gestion de projets** : l'exploration de la planification collaborative en gestion de projets permet de valoriser une telle pratique au prêt des gestionnaires de projets. Dans les projets de transformation d'affaires, la planification collaborative permet d'augmenter l'engagement des parties prenantes et facilite la gestion du changement. Les leaders des initiatives de transformation d'affaires reconnaissent l'importance de la composante humaine dans ce type de projet, et la planification collaborative s'ajouterait à leur boîte à outils pour augmenter les chances de réussite.

Les contributions méthodologiques de cette recherche peuvent être présentées comme suit :

8. **La combinaison de l'approche de recherche-action participative et l'étude de cas multiples** : dans la littérature en gestion de projets les deux approches méthodologiques existent, mais pas en combinaison. Cette approche a permis l'accès aux données du partenaire industriel sur des projets considérés délicats stratégiquement pour l'organisation. Aussi, elle a permis une compréhension du contexte organisationnel des cas étudiés qui a fait la différence lors de la codification et l'interprétation des données.
9. **Analyse par processus de la planification des projets :** la littérature en gestion de projets traite rarement de la planification comme un processus selon une analyse des activités, décisions, séquences, intrants, extrants et ressources (Andersson et Johansson, 1996; Alexander Laufer, 1992). L'article 2 de cette thèse utilise une approche d'analyse répondue dans le domaine de la réingénierie des processus (*People, Process, Technology*). L'avantage d'une telle approche réside dans l'analyse holistique de la planification en permettant une vue détaillée.

9.4 Défis et limitations de recherche

L'approche méthodologique choisie pour cette recherche (voir la Figure 3-2) a bien servi à l'exploration des trois thèmes centraux à l'objectif général de recherche (voir la Figure 3-1). L'objectif général et les objectifs spécifiques de la recherche ont été atteints. Cependant, d'un point de vue méthodologique certains défis de recherche et des limitations sont à mentionner :

1. **Validation et généralisation restreintes des résultats** : l'approche adoptée pour cette recherche est exploratoire basée sur des données d'un seul contexte organisationnel. La généralisation et la validité externe des résultats requièrent une extension de la même approche à d'autres organisations ou la compléter avec d'autres sources de données et approches méthodologiques. Ceci dit, certains résultats peuvent être transférables (Tracy, 2010). Dans des contextes organisationnels similaires et pour des projets de même nature transformationnelle, les résultats sur l'adaptation du cadre de transformation d'affaires peuvent être transférables.
2. **Défis de satisfaire les exigences du partenaire industriel** : L'utilisation de la recherche-action participative a permis d'aligner avec les exigences du partenaire d'affaires. Le

principal défi pour l'équipe de recherche était de garder l'intervention dans les limites acceptables de l'approche de recherche participative sans tomber dans le rôle de consultation (Coghlan, D. and Brannick, 2012). Le partenaire industriel peut s'attendre à ce que l'équipe de recherche offre des solutions à quelques problématiques identifiées lors de l'étude. Les choix et les avis des membres de l'équipe interne du partenaire industriel peuvent donc être influencés par ce motif organisationnel. En contrepartie, les mises en contexte et les connexions expliquées lors de la collecte des données sur les cas sélectionnés auraient été impossibles sans l'aide de l'équipe interne du partenaire industriel. Avoir au moins trois perspectives différentes sur une situation ou une observation dans les données enrichit leur interprétation. Cette mise en relief a certes influencé la codification des données.

3. **La codification des données par un seul membre de l'équipe de recherche** : cette limitation a été causée par la difficulté d'interpréter les données sans une connaissance approfondie du contexte organisationnel du partenaire industriel. Comme mesure d'atténuation de cette limitation, la codification a été revue par un autre membre de l'équipe de recherche et par un membre de l'équipe interne du partenaire industriel. Par ce fait, l'équipe du partenaire industriel a découvert les avantages d'une analyse thématique et les possibilités de l'utiliser pour la résolution de problèmes où des données textuelles et des documents sont plus abondants que des données structurées. Un membre de l'équipe de recherche a démontré l'utilisation de l'analyse thématique pour une analyse cause à effet dans le cadre d'un projet d'amélioration de processus.

En perspective et en évaluant les résultats de cette recherche vis-à-vis de la conception du projet de recherche, quelques améliorations seraient possibles pour augmenter la qualité de cette étude et en enrichir les résultats :

4. **Surmonter les défis de cartographie des processus de planification des projets** : l'analyse par processus effectuée a été basée sur une cartographie des processus de planification des cas étudiés. Cependant, ce fut un défi de documenter ces processus, d'en déterminer la séquence exacte des activités, et d'aller plus en détail sur les prises de décisions et comment elles se sont faites. Il est possible d'atteindre des résultats équivalents de cette recherche par une conception différente de l'approche et question de recherche. Par

exemple, un accent sur la prise de décision pourrait être une autre façon de décortiquer la planification collaborative dans les projets.

5. **Identifier d'autres perspectives ou proxy pour représenter la collaboration** : la collaboration dans les projets peut être définie de différente manière. Ceci dit, pour la cause d'étudier ses dynamiques et ses exigences en lien avec la planification, il est possible d'adopter une perspective spécifique utilisant un proxy pour représenter l'effort de la collaboration. Par exemple, dans la littérature les interactions entre les entités peuvent être utilisées comme une mesure représentative de la collaboration entre elles. Dans le domaine de la scientométrie, la collaboration entre chercheurs, universités et autres organisations peut être représentée par les publications conjointes. Si cette recherche est reprise avec cette perspective de la collaboration, une étape préparatoire serait d'essayer de définir cette façon représentative de la collaboration pour les projets. Par exemple, l'utilisation des contrats a été utilisée pour évaluer les relations interorganisationnelles dans les projets (Agostini et Nosella, 2019).
6. **Exploitation limitée de la littérature sur la collaboration** : la collaboration est un sujet étudié dans la littérature selon plusieurs perspectives et dans divers domaines et disciplines. Cette thèse s'est concentrée sur la collaboration tel que définie dans la littérature en gestion de projets. Ce qui peut être considéré comme une perspective étroite de la collaboration compte tenu la richesse de la littérature sur le sujet dans d'autres domaines. Les résultats de cette étude peuvent être bonifiés en intégrant la littérature d'autres disciplines de recherche.

Le paragraphe suivant présente des avenues possibles de recherche pour concrétiser les opportunités identifiées par les défis et limitations de cette étude.

9.5 Avenues de recherche

Pour pallier limitations méthodologiques, les avenues suivantes aideraient à améliorer la validité externe et la généralisation des résultats :

1. **Valider les observations et résultats par un sondage interne avec le partenaire industriel puis externe dans d'autres organisations** : l'utilisation de sondage pour étendre le nombre d'employés du partenaire industriel aiderait à valider en premier lieu les

résultats vis-à-vis du même contexte organisationnel. Par la suite, raffiner les résultats avec d'autres praticiens dans d'autres organisations.

2. **Étendre la même approche de recherche à plusieurs organisations** : en gardant la même approche méthodologique et en ajoutant d'autres cas dans d'autres organisations permettraient d'une part de valider les résultats de cette recherche et, si l'échantillon des cas et organisations est significatif, généraliser une partie des résultats.

Cette recherche s'est terminée par une identification des exigences de la planification collaborative pour les projets de transformation d'affaires. Les deux avenues de recherche suivantes permettraient d'utiliser ces exigences pour concevoir et proposer un modèle de la planification collaborative en gestion de projets :

3. **L'utilisation de l'ingénierie de la collaboration (*Collaboration Engineering*)** : les résultats de l'article 2 indiquent que la planification est supportée par la présence des pratiques d'intégration et de facilitation. Les exigences de la planification collaborative identifiée dans l'article 4 incluent aussi ces deux pratiques en lien avec la coordination. L'essence des deux pratiques peut être trouvée dans les processus et techniques de la facilitation. L'incorporation de la facilitation aux processus de planification serait une piste de solution vers un modèle de planification collaborative. Pratiquement, ceci voudrait dire la conception de processus de planification des projets qui a comme partie intégrante des sous-processus et techniques de facilitation assurant les exigences de la collaboration lors de leur exécution. Ceci est possible en utilisant l'ingénierie de la collaboration « *collaboration engineering* » (CE) (de Vreede et Briggs, 2005). La CE est une approche de conception de processus d'affaires qui intègre les pratiques de facilitation pour augmenter la répétabilité du travail collaboratif (Kolfschoten, Vreede et Briggs, 2007). Elle se base sur l'utilisation de Thinklet; un modèle de conception qui permet de combiner les activités d'affaires à une ou plusieurs techniques de facilitation (Kolfschoten, Briggs, de Vreede, Jacobs et Appelman, 2006). En pratique, les Thinklets s'ajoutent au coffre à outils et techniques des praticiens qui exécutent les processus d'affaires (Kolfschoten et al., 2010). Les applications de la CE sont prometteuses et les cas pratiques présentent des résultats intéressants qui encouragent son développement et son usage (Kamrani et Nasr, 2008; Kolfschoten et al., 2010; Schwabe, Briggs et Giesbrecht, 2016).

4. **La modélisation et la simulation utilisant des systèmes agents** : Le concept d'agent provient des travaux en intelligence artificielle. Un agent est une procédure logicielle qui représente une logique de raisonnement orientée vers un objectif défini. Le concept d'agent, aussi appelé agent intelligent « *Intelligent Agent* » ou agent logiciel « *Software Agent* » représente une unité de contrôle autonome capable d'interagir avec son environnement (Franklin et Graesser, 1997). La modélisation et simulation par systèmes agents a été utilisée en gestion des chaines logistiques pour développer la planification collaborative (Fox, Barbuceanu et Teigen, 2000). Aussi, les systèmes agents ont été utilisé en gestion de projets pour la gestion des risques (Taillandier et Taillandier, 2014), la modélisation des relations collaboratives (Son et Rojas, 2010), et pour l'ordonnancement (Knotts et Dror, 2003). Avec les avancements dans les technologies d'information et des systèmes agents en particulier, leur utilisation pour modéliser un processus de planification collaborative en gestion de projets est une piste de développement intéressant pour le futur.

Au-delà des avenues de recherche directement liées au choix méthodologique du sujet de recherche de cette thèse, voici quelques idées de recherche qui ont émané des travaux et sujets explorés :

3. **Réconcilier les entités et théories de planification en gestion de projets** : la planification collaborative en gestion des chaines logistiques est définie par rapport à des entités de planification (Kilger et Reuter, 2005), elles représentent des organisations ou même des réseaux de fournisseurs dans la chaine logistique. Dans les projets, ces entités peuvent être aussi des organisations, des départements, des équipes et même des individus. Cependant, les théories de la planification pour ces différents types d'entités varient et se concentrent sur des aspects différents. Par exemple, pour les individus les théories de la psychologie cognitive sont appliquées pour comprendre le raisonnement et la prise de décision lors de la planification des individus (R. Morris et Ward, 2005). Pour les organisations, la planification prend plusieurs formes; stratégique, financière, manufacturière, etc. toutes avec des théories et pratiques qui varient. Alors, quelles sont les entités de planification pertinentes en gestion de projets ? Et comment réconcilier les différentes théories de planification qui s'y appliquent ? Si toutes ses entités de planification coexistent, arrimer les théories de planification entre elles pousserait la réflexion sur la planification au-delà de l'entité elle-même, mais en relation avec les autres entités dans le projet.

4. **Les cadres de gestion de la transformation pour les gouvernements :** les notions de transformation d'affaires sont aussi explorées pour les organisations gouvernementales. La littérature a utilisé certains exemples de changements de processus ou d'implantation de systèmes d'information pour discuter des particularités du contexte gouvernemental (Stemberger et Jaklic, 2007). Cependant, la transformation d'un gouvernement, incluant toutes ses institutions, implique des complexités d'autres natures qu'en entreprise. Ainsi, les cadres de gestion de telles initiatives requièrent des compétences et des processus différents de ceux en place dans les organisations gouvernementales actuelles (Allas et al., 2018). Étudier la transformation au niveau des gouvernements conduira à une discussion des théories sur les politiques gouvernementales comme les liens avec les réformes et les impacts socio-économiques. La nature des relations dans le contexte gouvernemental se base aussi sur des liens de pouvoir, d'intérêt public, et des bénéfices non tangibles (Kettl, 2000) qui sont très peu présents dans les relations dans les transformations des entreprises. Par conséquence, les cadres et les pratiques de gestion de projets de transformation gouvernementale pourraient être fondamentalement différents de ceux étudiés dans la littérature jusqu'à maintenant. Actuellement, il y a une tendance autour de la transformation digitale des services gouvernementaux. Dans la littérature, des études de cas sur des initiatives e-gouvernement peuvent être trouvées (Janowski, 2015; West, 2004). Mais comme pour les entreprises, les technologies de l'information représentent une dimension de transformation qui s'est avérée souvent non suffisante par elle-même pour livrer les bénéfices et objectifs attendus.

En résumé, ce chapitre a discuté des thèmes communs dans les résultats exposés dans les articles, des contributions scientifiques de cette thèse, et des limitations de la recherche. Le tout a permis d'identifier des avenues de recherche en lien avec le sujet de recherche et ouvrir des perspectives de recherche plus larges dans d'autres sujets explorés lors des lectures et de l'étude de la littérature.

CHAPITRE 10 CONCLUSION ET RECOMMENDATIONS

L'objectif général de cette étude était d'explorer la planification collaborative dans le contexte des projets de transformation d'affaires. Une approche exploratoire a été adoptée combinant la recherche-action à une étude de cas multiples. Ceci était possible grâce à une collaboration avec un partenaire industriel permettant l'accès à des données confidentielles sur quatre projets et programmes de transformation d'affaires. L'approche méthodologique et les résultats décrits dans les articles incorporés ont permis d'atteindre les objectifs spécifiques de la thèse : décrire les spécificités des projets de transformation d'affaires, analyser les processus de planification de ces projets, et décrire les dimensions et exigences de la planification collaborative dans ce contexte.

En premier, cette étude s'est concentrée sur la compréhension du contexte organisationnel et les caractéristiques des projets de transformation d'affaires. L'article 1 (voir Chapitre 5) a présenté l'étude de ce contexte spécifique. Il réitère l'importance de la gestion de projets et programmes pour la réussite des transformations d'affaires. Une comparaison d'une sélection de cadres méthodologiques de transformation d'affaires a révélé la valeur de leur adaptation au contexte d'une organisation. En utilisant le contexte du partenaire industriel, un cadre de transformation d'affaires a été suggéré. Cet effort a identifié quelques paramètres d'adaptation et a souligné l'influence de la maturité de l'organisation dans certaines pratiques clés comme la gestion du changement organisationnel.

Ensuite, cette thèse a analysé les pratiques de planification et de contrôles des projets en application dans les cas sélectionnés. La contribution méthodologique de l'article 2 (voir Chapitre 6) consistait à l'utilisation d'une approche d'analyse par processus qui est peu fréquente dans la littérature en gestion de projets. L'analyse confirme une variété dans la définition de la planification, de sa portée et de sa perception par les participants aux projets. Elle identifie quelques caractéristiques de la planification pour les projets de transformation d'affaires, dont l'importance relative des parties prenantes internes, le rôle central de la gouvernance à définir les rôles lors de la planification et la prise de décision, et la distinction de l'intégration et la facilitation comme des rôles clés pour une planification efficace. Les données sur les pratiques de planification des cas ont mis en surface l'opportunité de transposer la pratique de planification conceptuelle du contexte des projets de construction aux projets de transformation d'affaires. L'article 3 (voir Chapitre 7) a donc discuté de cette pratique et ses caractéristiques en transformation d'affaires.

Le troisième thème de cette recherche a porté sur l'aspect collaboratif en planification. Plus spécifiquement, l'intérêt a été porté sur la planification collaborative comme une pratique existante dans d'autres domaines de recherche, mais moins présente en gestion de projet. L'article 4 (voir Chapitre 8) traite des deux dimensions de la planification collaborative dans le contexte de cette étude; la planification de la collaboration comme un coût ou effort du projet et la planification en collaboration. Pour ce dernier, des exigences d'intégration de la collaboration aux processus de planification ont été identifiés. Ils couvrent les aspects d'échange d'information, de coordination, et de prise de décision. Ces exigences représentent la première étape vers la conception d'un modèle de planification collaborative en gestion de projets.

La généralisation des résultats de cette étude reste restreinte à cause de son approche exploratoire et la spécificité du contexte d'étude choisi, mais certains aspects restent transférables. Des recherches futures peuvent étendre les cas étudiés à plus d'organisations et de projets et programmes, ce qui permettrait une validation des observations et résultats reportés dans cette étude. Ceci dit, cette thèse rejoint un courant de recherche en gestion de projets qui explore la contextualisation des projets comme une voie de développement des pratiques de gestion de projets. Plus spécifiquement, cette étude met l'accent sur la transformation d'affaires comme un contexte d'étude riche en opportunités de recherche en gestion de projets surtout de par la nature et l'impact de ces initiatives sur les organisations. En plus, discuter de la planification collaborative en gestion de projets ouvre la porte à un questionnement sur l'évolution de la planification en gestion de projets en comparaison avec d'autres domaines comme la gestion manufacturière et les chaines logistiques. Finalement, et d'un point de vue pratique, cette recherche peut servir d'une première tentative à guider les praticiens des transformations d'affaires à adapter les cadres proposés par la littérature et les firmes de consultation aux contextes spécifiques de leurs organisations. Cette recherche permet ainsi de conscientiser ces gestionnaires de projets à l'importance de la collaboration et d'en tenir compte lors de la planification des projets de transformation d'affaires en tant que coût à planifier et en tant qu'attribut et nature du processus de planification.

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ANNEXES

ANNEXE A – ENTREVUES SEMI-STRUCTURÉES

Tableau A-1: Liste des participants aux entrevues semi-structurées

Cas - Participant	Position dans l'organisation	Nombre d'années dans l'organisation
Contexte – P1	Directeur Stratégie IT, et Directeur de programme de transformation	7
Contexte – P2	Vice President IT (CIO)	5
Cas 1 – P1	Gestionnaire relations d'affaires en IT	3
Cas 1 – P2	Gestionnaire de projet	5
Cas 1 – P3	Spécialiste en gestion du changement	5
Cas 1 – P5	Spécialiste en gestion du changement	5
Cas 1 – P6	Spécialiste en gestion du changement	10
Cas 1 – P7	Analyste d'affaires	2
Cas 2 – P1	Gestionnaire relations industrielles en IT, et Gestionnaire de portfolio sur le programme Cas 2	30
Cas 2 – P2	Conseiller au Président Directeur Général	10
Cas 2 – P3	Gestionnaire de projet	10
Cas 2 – P4	Directrice livraison de services aux opérations	10
Cas 3 – P1	Directrice relations d'affaires IT	30
Cas 3 – P2	Gestionnaire de projet	5
Cas 3 – P4	Conseillère en optimisation des affaires	5
Cas 3 – P5	Spécialiste en gestion du changement	10
Cas 4 – P1	Analyste de solution en IT	10
Cas 4 – P2	Analyste d'affaires	10
Cas 4 – P3	Gestionnaire relations d'affaires IT	30
Cas 4 – P4	Gestionnaire des projets de développement aux opérations	5
Cas 4 – P5	Architecte de solution IT	20

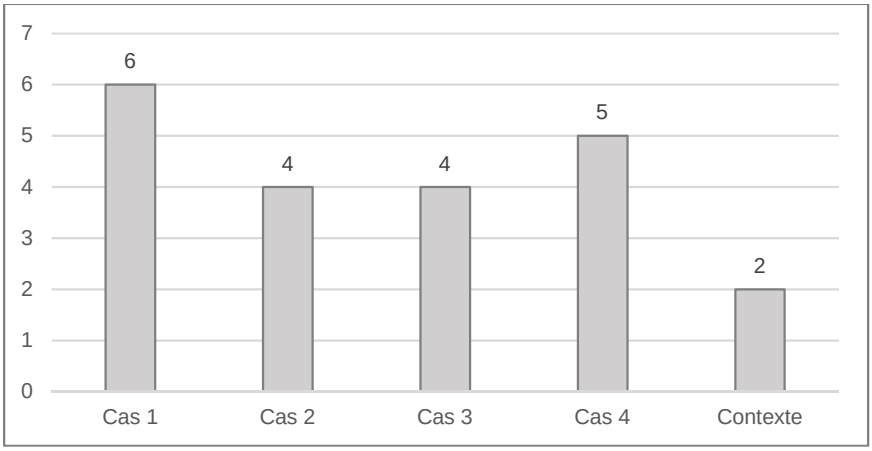

Figure A-1 : Nombre de participants par cas

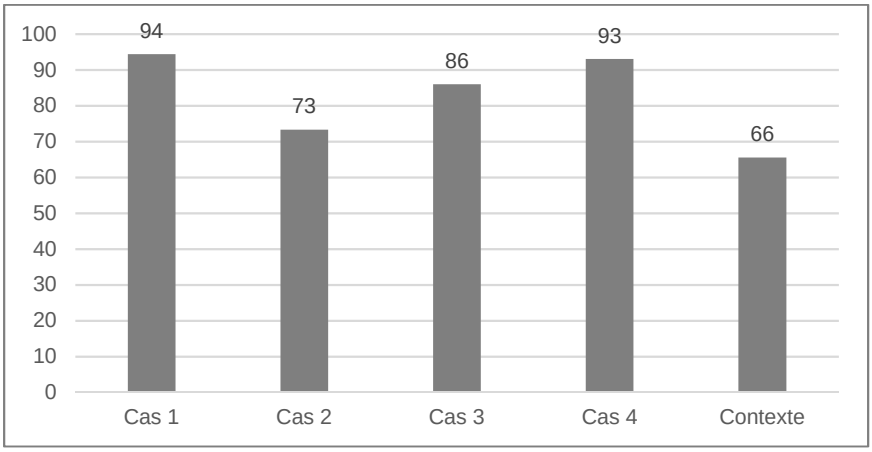

Figure A-2 : Durée moyenne des entrevues par cas (en minutes)

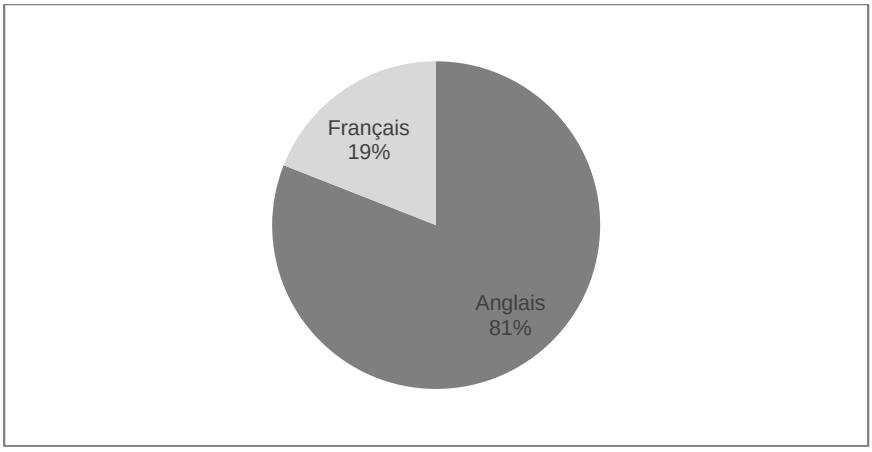

Figure A-3 : Distribution du nombre de participants par langue d'entrevue

Guide et questionnaire des entrevues (en anglais)

1. Introduction and Research Context

The research should make sure these actions are checked before starting the interview. It will provide context and assurances to the participants. These actions will prepare for the questions following and will keep the participant at a comfortable zone with the information he or she will provide.

- Thank the participant for agreeing to provide the interview.
- Present the research project and team.
- Introduce and sign the consent form.
- Ask permission to record the interview.
- Explain to the participant the interview overview and structure.
- Explain how the interview information will be used and under which conditions (confidentiality)

2. Project

2.1. Project context

2.1.1. What were the drivers (incentives, needs, etc.) for this project (why did it start)?

2.1.2. What were the initial scope and objectives for this project?

2.1.3. When did the project started and ended?

2.1.4. What were the initial budget and the actual cost of the project?

2.1.5. Who are the stakeholders of the project?

2.1.6. Who are the leads for the project from each stakeholder's group?

2.1.7. Who is the project manager?

2.1.8. What are the characteristics of the relationships between stakeholders outside the project? Are they used to work in collaboration on projects? Is there any history behind their positions or perceptions of each other?

2.1.9. For each phase of the project, what were the characteristics of the relationships between stakeholders?

2.1.10. What were the key changes (positives or negatives) caused by the project in the organization? (Examples: process, technology, people structure, financials, operations, customers, etc.)

2.2. Interviewee's role

2.2.1. What were your main responsibilities during the project?

2.2.2. What are the key activities that you performed?

2.2.3. What were your deliverables for the project?

2.2.4. Who were your key stakeholders and partners during the project? (In terms of work relations and dependencies to execute your activities)

2.2.5. How would you describe your role in planning this project?

2.2.6. How would you describe your role in collaborating or enabling the collaboration during this project?

3. Framework of transformational projects

3.1. Characteristics of transformation

3.1.1. How would you define transformation?

3.1.2. How is this project transformational in the context of the company?

3.1.3. How would you describe the size of the project? (Resources involved, budget, duration, etc.)

3.1.4. What changes did the project bring to the organization? (HR structure, processes, technologies, value delivery, internal and external relations, etc.)

3.1.5. Why those changes were introduced? What are the drivers?

3.1.6. What are the impacts of theses changes beyond the project? What did change outside the projects scope or intended objectives?

3.1.7. How did the project team manage and deal with complexity of the project? In terms of deliverables, activities to be performed, planning, risk assessment, etc.

3.1.8. Please choose one change that the project introduced, on which you worked closely and provide us with more details about it.

3.1.9. How many employees were impacted by this project's outputs? What are the different levels of impact intensity?

3.2. Success factors

3.2.1. On scale from 1 to 10, how successful was the project? (10 being very successful).

3.2.2. What made this project a success or a failure? Leadership, resources, engagement, change management, planning, collaboration, etc.

3.2.3. What is particular in this project that cannot be transposed to future projects?

3.2.4. What would you change to the project to make it successful or more successful?

3.2.5. What is your take away in terms of practice and work structure from this project?

3.3. Framework of the project

Provide a quick explanation for the participants about this section. The objective is to analyze how the project was delivered (phases, activities and tools).

3.3.1. Please describe the high level phases of the project?

3.3.2. What was your involvement in each phase?

3.3.3. For each phase, what are the key steps/activities that occurred during this project?

3.3.4. For each phase, what are the key deliverables that were generated during this project?

3.3.5. What activities would change (add, remove) to enable a more successful project? Why? Please provide details on the reasons for your choices.

3.3.6. What tools were efficient in delivering the project objectives? Technology, documents, techniques, etc.

3.3.7. What practices are the most critical for the project at each phase? Project management, change management, risk management, etc.

3.3.8. In a scale from 1 to 10, how important is planning in a transformation framework? (10 being very important)

3.3.9. If planning is important, what makes it important in the context of a transformation project? Specifically in the context of the company?

4. Project planning

4.1. Planning definition and dimensions

4.1.1. In the context of the company's practices, what is your understanding/definition of project planning?

4.1.2. What were your expectations from the planning activities of the project? Were they met? And why?

4.1.3. What were the components for the final deliverables of planning? What did planning include?

4.2. Planning process and roles

4.2.1. What were the key activities/steps for this project planning?

4.2.2. What were the key deliverables for this project planning?

4.2.3. What were the different roles that intervened in the planning process?

4.2.4. What tools were used to support the process and activities of planning? Tools, templates, software, etc.

4.2.5. How did you contribute to this planning process?

4.2.6. How did you align your own planning (weekly, monthly, by deliverable) to the project plan?

4.2.7. Who were the stakeholders with the most influence on the planning process? Why?

4.2.8. What were the inputs required to plan the project? From the project as a whole? From your perspective as a member of the project team?

4.2.9. What were the top 3 challenges during the project planning?

4.2.10. What were the channels of communication during the project planning?

4.2.11. Please provide an example of a situation were planning decision making happened during the project? Who were the actors? What was the topic of decision? What was the process?

4.2.12. Please describe a conflictual decision during the planning process? Who were the actors? What was the topic of decision? What was the process?

4.2.13. What would you change in this project planning to enable more success?

5. Collaboration

5.1. Collaboration context and definition

5.1.1. What is your understanding/definition of collaboration?

5.1.2. What is your understanding/definition of collaboration at the company as work environment?

5.1.3. How does collaboration relate to the company's work culture?

5.2. Collaboration dimensions and participants

5.2.1. What is the collaboration aspects during this project?

5.2.2. How would you describe the collaboration relationships between stakeholders during this project?

5.2.3. At which phases was collaboration most intensive? How?

5.2.4. What were the aspects of collaboration during the planning of the project?

5.2.5. How did collaboration contribute or not to the successful planning of the project?

5.2.6. From your perspective, what were the key information exchanges during the project? What was their content? How were they conveyed? Who were the stakeholders involved?

5.2.7. What were the decision making mechanisms during the project? During the planning?

5.2.8. How did the relationships between stakeholders influence the project planning and delivery?

5.2.9. What were the tools that enabled collaboration during the project?

5.2.10. What were the challenges of collaboration during this project?

5.2.11. What was missing for the collaboration to be optimal?

6. Collaborative planning

6.1.1. How important is collaboration to the project success? Why?

6.1.2. How did you plan your collaboration effort and cost? (Based on the participant' understanding of collaboration. Provide a definition of collaboration if required)

6.1.3. How did you track your collaboration effort and cost?

6.1.4. How collaborative was the planning process for this project?

6.1.5. What should a collaborative planning process include to enable a successful project delivery?

6.1.6. Who should be the stakeholders to involve in a collaborative planning effort?

6.1.7. What are their respective roles?

6.1.8. What challenges would prevent the use of a project collaborative planning process?

6.1.9. What strengths and opportunities at the company that you would leverage to ensure the use of a collaborative planning process?

Exemples de documents utilises

Les documents sélectionnés pour l'analyse diffèrent entre les cas. Dans ce qui suit une description sommaire de quelques documents types utilisés.

- **Documents de gestion de projets** : Des documents fournissant des informations sur la planification et la livraison des projets. Il s'agit principalement d'échéancier de projet, budget, présentation pour le démarrage du projet, des rapports de suivi et contrôle, ainsi que des listes de suivi de risques et d'actions.
- **Documents techniques** : Des documents qui décrivent les processus, les technologies de l'information, ou tout autres aspects de l'organisation sur lequel les projets portent. Par exemple, des architectures de données et de solutions sont souvent présentes quand une composante IT existe. Des cartographies de processus sont généralement le type de documentation utilisée pour la description des états actuels et futurs des processus.

- **Documents d’affaires ou de contexte** : Des documents qui expliquent le contexte du projet ou qui établissent des liens avec d’autres dimensions du contexte organisationnel. Par exemple, certains projets auront des documents de formation sur l’unité d’affaires dans laquelle le projet prendra place expliquant la nature du travail, les objectifs d’affaires et une vue d’ensemble sur les processus d’affaires.

ANNEXE B – EXEMPLES D'UTILISATION DE NVIVO POUR L'ANALYSE DES DONNÉES

B.1. Structuration des données

Les documents collectés, les entrevues transcrites et leurs enregistrements audio ont été chargés dans la base de données Nvivo. Le logiciel permet de regrouper les sources de données sous une structure équivalentes à l'explorateur de documents dans Windows. Il permet aussi de créer des classifications qui peuvent être associées aux différentes sources de données.

Figure B.1: Capture écran Nvivo 12 – Sources des données

B.2. Codification des données

La codification dans Nvivo se fait en associant un document, une portion, ou un texte sélectionné à un code (appelé *node* dans Nvivo). Les différents codes peuvent être organisés sous forme de hiérarchie parent-enfant pour créer des thèmes.

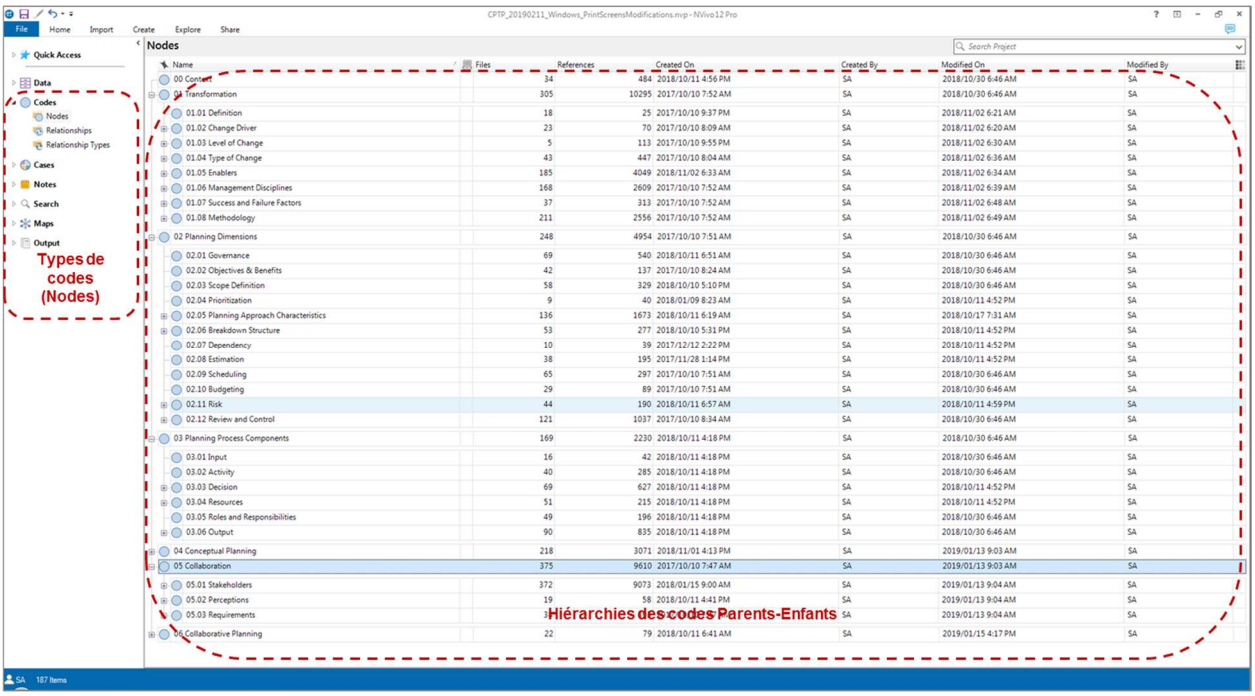

Figure B.2: Capture écran Nvivo 12 – Structure des nœuds et thèmes

Ci- après un extrait des codes et thèmes utilisés pour l'analyse finale.

Tableau B.1: Extrait des nœuds et thèmes

Code Name	Code Description	Files	References
00 Context	Explanations or details adding clarification to the context of a all cases; such as information about the company in general, some background on a specific subject, etc.	34	484
01 Transformation	Elements related to the characteristics, methodologies, and components of a transformational project/program	305	10295
01.01 Definition	Capture how transformation is defined by participants in interviews or through the documentation.	18	25
01.02 Change Driver	The reasons or root causes of the change initiated by the project or program	23	70
Evolving need for change		4	8
01.03 Level of Change	Based on the frontier of the change impacts internal and external to the organization	5	113
Business Area	Defined by a specific stream of products and services and has its own revenue stream and cost structure. It may include cross business area(s) changes.	1	1
Business unit	Department or group within a functional business unit in the organization. It may include cross business unit changes (inter business units)	1	30
Company	Across all the company at various levels and touching various value chain components of the organization.	3	80

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
Ecosystem	Beyond the company and its units and areas, it touches the customers, vendors and partners to influence the business ecosystem of the organization.	1	1
01.04 Type of Change	Type of project or change that is planned.	43	447
Organizational change	Changes in the organizational structure or key positions, a change to the culture of team or its work dynamic.	21	104
People change	Change required in the specific job tasks, behaviours, skills, competencies of individuals in the organization	24	65
Process change	Change in the steps, approach or activities of a process within the organization.	26	151
Technology change	A change of technology or information system to support the business drivers	19	87
01.05 Enablers	Practices and techniques that enable the transformation. They can be analytical for current state assessment and for future state design. And they can be organizational applicable to all phases and steps of the transformation.	185	4049
Analytical Enablers		111	1631
Architecture		23	162
As-Is Analysis		34	377
Audience Analysis		11	61
Benchmarking		18	204
Change Impact Analysis		5	9
Data Governance and Quality	Managing and analysing the quality of existing data and establishing processes and governance to manage it efficiently in the future.	9	52
Documentation		8	11
Integration	The ability to look at the overall system complexity, make links and integrate required needs and solutions.	24	109
Market research		4	31
Requirements		29	192
To-be design		31	349
Voice of customer		9	69
Organizational Enablers		121	2418
Communication		67	738
Culture		8	20
Engagement		46	492
Facilitation		16	31
Governance		58	419
Leadership		28	122
Organizational Maturity		25	181
Sponsorship		21	67
Steering Committee		36	346
01.06 Management Disciplines	Management practices that contribute to the transformation. They represent the multi-lens	168	2609

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
	and multi-disciplinary aspect of the transformation.		
Business Process Management		35	293
Human Resources Management		41	565
Information and Technology Management	Discipline focusing on selecting or developing and implementing the appropriate information systems and technologies to the organization's needs.	47	320
Organizational Change Management	Referred to as change management too. It is the disciplines that deals with evaluating and managing the changes in the organization: process, technology, people as individual, people as an organizational structure.	57	660
Program Management		14	112
Project Management		24	158
Risk Management		23	116
Strategy and Performance Management		46	331
Value and Financial Management		11	53
01.07 Success and Failure Factors		37	313
Failure		18	110
Lesson Learned		19	119
Success		24	81
01.08 Methodology		211	2556
01.08.01 Initiation		80	663
Scope definition		58	329
01.08.02 Blueprinting & Design		86	858
01.08.03 Execution - Delivery		61	510
RFP		16	109
Testing		13	59
01.08.04 Implementation - Deployment - Roll Out		40	368
Deployment - Transition Approach	Describes how implementation of a type of change will be conducted. These approaches on a spectrum between step by step (phased) to one time (big bang) implementation. It is referred too in the cases as deployment.	13	32
Information System Implementation		20	155
Piloting		3	3
01.08.05 Closure		12	126
02 Planning Dimensions	Elements touching on planning (process, decision making, roles, etc.)	248	4954
02.01 Governance		69	540
02.02 Objectives & Benefits	Taken from program management vocabulary. It indicates the various benefits expected from a project/program. Benefits	42	137

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
	can be financial like reduction in costs or increases in revenues. Or they can be operational linked to productivity measures. Or they can be about customer experience, communication, and other cultural and "soft" aspects.		
02.03 Scope Definition	Activities and deliverables that define the scope of the project or program.	58	329
02.04 Prioritization	Any activity, process or tool to prioritize within the project or program: requirements, activities, deliverables, etc.	9	40
02.05 Planning Approach Characteristics		136	1673
Execution strategy	Elements describing how the project plan will be executed.	28	105
Concurrent	Indications of concurrent/parallel scheduling of activities.	12	29
Iterative		23	109
Release - Wave		3	17
Sequential		9	28
Hierarchy - Horizon	Represents the cascade of planning details and the horizon of planning. Most of literature references indicate 3 levels: strategic, operational and tactical.	12	39
Planning Level	Indicates if planning is done at the program (umbrella) level, or project (specific) level.	119	1301
Program Planning		68	759
Project Planning		59	484
Planning Rules & Structure	Indications of guidelines and structures defined by the project/program on how work in project/program will be performed. Ex. documents templates, quality criteria, reporting procedure, etc.	36	228
02.06 Breakdown Structure	Elements of breaking the scope of a program or project into a structure of activities and deliverables	53	277
Program Breakdown Structure	Items describing how the program was structured into projects, how they are linked and how the overall scope and benefits of the program are distributed at the projects level.	31	151
Project Breakdown Structure	The breakdown of the project's activities or deliverables following WBS technique or a PBS technique.	29	126
02.07 Dependency	Indications of dependencies: between activities, projects within program, with other projects or programs (out of the scope), with other business considerations. It has also any mention to links and inter-relations.	10	39
02.08 Estimation	Any type of estimation is included here: hours, capacity, costs, etc.	38	195
02.09 Scheduling	Any elements related to timeline, scheduling, activities sequencing.	65	297
02.10 Budgeting	All items describing the costs structure of the program or project (fixed costs, labor costs, etc.), any accounting considerations (capital vs operating costs), definition of the source of funds (cost center, profit center, etc.)	29	89

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
02.11 Risk		44	190
Complexity	Indications on the complexity of the situation: either from a project management perspective (a lot of elements to handle), or from a business perspective (links to various business subjects and areas), of from a technical/technological perspective (systems, software, hardware, etc.)	20	61
Uncertainty		8	13
02.12 Review and Control	Includes any type of reporting, updates and follow ups to review the progress of the project or program.	121	1037
Re-planning	Specific indications of decisions and activities for re-planning purposes. It is not for mere updates of current plan. It is rather an overall review of the plan as an approach and output.	12	52
Scope Change Management	Elements related to project/program changes of scope, budget, timeline, or any other component, and how it is managed.	11	24
03 Planning Process Components	The decomposition of the planning process into basic components (1) activity or decision (2) Inputs (3) Outputs (4) Resources	169	2230
03.01 Input	Information or deliverables that are inputs to a planning activity or decision.	16	42
03.02 Activity		40	285
03.03 Decision		69	627
Constraints - Assumptions	Any type of constraint to the decision making activity. It includes also assumptions about the available information or situation for decision making.	28	75
Revaluation	Situations where a review of a previous decision is required. It indicates the effort to challenge and question previous decisions.	2	16
Scenarios Evaluation	The definition and comparison of options or scenarios for a planning decision.	12	87
Validation - Approval - Sign-Off	Any type of decision that is more about the validation of information or deliverables, the approval of a step. These decisions are less about the decision maker actively involved in the decision, but they are checkpoints or gates to move to the next step.	21	172
03.04 Resources	It covers areas around managing resources for the project or program. It can include time and capacity management information about team members or other types of resources.	51	215
Tools	Examples of tools facilitating the planning (to make decisions, track discussions, exchange information, etc.)	13	42
03.05 Roles and Responsibilities	Includes various roles of team members and participants in the project and program planning.	49	196
03.06 Output	Any information or deliverable from a planning activity or decision.	90	835
Project plan document		12	96
04 Conceptual Planning		218	3071

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
04.01 Horizon	Represents the cascade of planning details and the horizon of planning. Most of literature references indicate 3 levels: strategic, operational and tactical.	12	39
04.02 Level	Indicates if planning is done at the program (umbrella) level, or project (specific) level.	119	1301
Program Planning		68	759
Project Planning		59	484
04.03 Design		86	858
Analytical Enablers		111	1631
Architecture		23	162
As-Is Analysis		34	377
Audience Analysis		11	61
Benchmarking		18	204
Change Impact Analysis		5	9
Data Governance and Quality	Managing and analysing the quality of existing data and establishing processes and governance to manage it efficiently in the future.	9	52
Documentation		8	11
Integration	The ability to look at the overall system complexity, make links and integrate required needs and solutions.	24	109
Market research		4	31
Requirements		29	192
To-be design		31	349
Voice of customer		9	69
Organizational Enablers		121	2411
Communication		67	738
Culture		8	20
Engagement		46	492
Facilitation		16	31
Governance		58	419
Leadership		28	122
Organizational Maturity		25	174
Sponsorship		21	67
Steering Committee		36	346
04.04 Governance		69	540
04.05 Planning Rules & Structure	Indications of guidelines and structures defined by the project/program on how work in project/program will be performed. E.g. documents templates, quality criteria, reporting procedure, etc.	36	228
04.06 Delivery strategy	Elements describing how the project plan will be executed.	28	105
Concurrent	Indications of concurrent/parallel scheduling of activities.	12	29
Iterative		23	109
Release - Wave		3	17
Sequential		9	28
05 Collaboration	Any element that can be related to the different definitions of collaboration:	375	9610

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
	communication, information exchange, stakeholders, trust, conflicts, etc.		
05.01 Stakeholders	Teams, groups, departments, organizations that are involved in the projects. They may be considered as collaborators. They are either internal to the organization or external.	372	9073
External Stakeholders	Stakeholders that are active within the project, or influence its scope and results. They can be customers, suppliers, etc.	51	697
Customers	Customers in this analysis refers to the end customer of the company as transportation company. They are the owner of merchandise that requires movement or logistics services the company can provide.	5	38
Partners		3	18
Regulatory & Government		4	129
Suppliers & Vendors	A supplier can be for services or products. There are different types of suppliers depending on what they provide to the organization, and what type relationship they have with the organization (partnership, alliance, etc.).	44	510
Unions & Labour Relations		2	2
Internal Stakeholders		367	7966
CEO	The Chief Execution Officer of the organization or a member of his direct staff. The CEO can compose a team of employees to work on specific projects.	13	90
Finance & Accounting	Department containing functions around corporate finance, accounting, and treasury	5	9
I&T	Information and Technology	325	5259
BTS	Business Transformation Services: A team of internal consultants that helps all groups of the organization work on their strategic initiatives. Its mandates range from building departments strategic plans to business reengineering. It is part of I&T department, but almost all its mandates are business oriented with very little technological implications.	29	192
Business Analysis	Team of Business Analysts that get involved in I&T projects only. Its resources are assigned when an I&T project is initiated. They perform processes design, requirements gathering, software selection support, and development support.	41	462
Business Engagement	Team of business engagement managers that play a coordination role between business departments and units and the information and technology department.	37	380
Change Management	The change management team is part of the business engagement pillar in the department of information and technology. Prior to 2016, it used to be involved in information systems related projects. Then it became more of an	48	480

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
	organizational change management team that gets called for various change initiatives.		
CITO	Chief Information and Technology Officer	9	138
Delivery	This pillar of the information and technology department changed names few times. It is responsible mainly for the delivery of I&T projects specifically to information systems development and deployment. It is composed of developers, testers, designers, etc.	60	657
Enterprise Architecture	Team of enterprise architecture within I&T that focuses on strategic issues linked to technology aspects. This team was dismantled in 2017. Its members are now called business architects and perform similar roles but scattered in various important programs in the organization.	3	104
I&T Architecture	A team of IT architects (solution, domain, and application). They are involved in various stages of the projects. They can help define the opportunity and perform strategic assessments from a technology perspective. And they are also present in I&T projects to define the solution architecture and integration with current landscape.	42	422
PMO	Project Management Office: a team within I&T that oversees the structure and tracking of I&T projects and programs. It is closely linked to the delivery team, and project/programs team. They all are considered one pillar in I&T.	8	110
Project-Program Team	A team of project and program managers that are assigned on I&T projects and programs.	219	2114
Intermodal	Group focused on the operations of intermodal shipments. This group is considered operations. Historically, it changed position between the operations department and marketing department. At the time of the cases, it reported to Marketing (CMO). Since 2016, it has been reporting to Operations (COO).	81	905
Marketing	Department of Sales and Marketing. It is referred to internally as Marketing.	100	1110
Operations	Department with various groups with a mission to operate the organization assets. It includes also various customer facing roles that focus mostly on orders management and shipment information.	44	556
Supply Management	Procurement and supply management department. Referred to as supply management. It has the responsibility to procure all services and products for the company. It has dedicated teams for some categories (fuel, travel, etc.). It has also fleet management (vehicles that go on roads). And it is responsible of the inventory management (this last aspect is under review to reposition	8	37

Tableau B.1: Extrait des nœuds et thèmes (Suite)

Code Name	Code Description	Files	References
	the responsibility between Operations and Supply Management)		
05.02 Perceptions	Elements indicating how stakeholders and participants perceive or define collaboration in the general context or specific to the project or program at hand.	19	58
Perception in planning	Indications on how case participants perceive collaboration in the context of the planning process/activities.	12	19
Perception in project	General descriptions of situations where collaboration happened in the project/program. These situations reflect the participants' viewpoint and how they perceive collaboration in the project context.	16	39
05.03 Requirements	What is required for collaboration to be effective?	38	393
Enablers & Successes	Elements that indicate a successful collaboration or an enabler to a collaborative work.	34	275
Face to face collaboration	Situations where collaborators met in person, or suggested that meeting in person is critical to collaboration.	8	21
Knowledge sharing	Share business knowledge about the project, the company or the industry.	14	136
Participation	Situations where it is not clear the extent of collaboration, and where there is at least a participation in a team effort (workshop, sessions, etc.)	8	10
Team	Indications where participants discussed team dynamics and team related subjects.	22	76
Tools	Any tools, equipment or technology used to support collaborative work during the project.	10	16
Trust	Explicit mention of trust as being a key to collaboration.	10	16
Inhibiters & Failures	Elements that indicate a failure to collaborate or specific inhibiters to collaborating between teams or participants.	16	66
Absence of collaboration	Indication of a failure to collaborate or lack of it.	13	41
Conflict	Situations where a conflict exists. It is not considered here an absence of collaboration. Rather an indication of a challenge.	9	25
06 Collaborative Planning	Indications of a planning process and activities that took place with an element of collaboration. There are mainly two aspects detected in the data (1) information sharing (2) joint decision making.	22	79
Information Exchange & Sharing	Indications of information exchange and sharing between participants in the planning process.	13	40
Integration	The ability to look at the overall system complexity, make links and integrate required needs and solutions.	24	109

Tableau B.1: Extrait des nœuds et thèmes (Suite et fin)

Code Name	Code Description	Files	References
Joint Decision Making	Situations where the decisions were taken in collaboration, or at least exhibiting a joint process to get to the decision. Either through a facilitation process to reach a consensus or compromise between stakeholders on a decision. Or any other sign of a group of people reaching an agreement for a decision.	32	186

B.3. Analyse des thèmes

La figure suivante explore les sources de données et éléments en lien avec un nœud spécifique. Cette visualisation permet d'explorer des liens erronés ou une incohérence en lien avec d'autres nœuds dans la base de données.

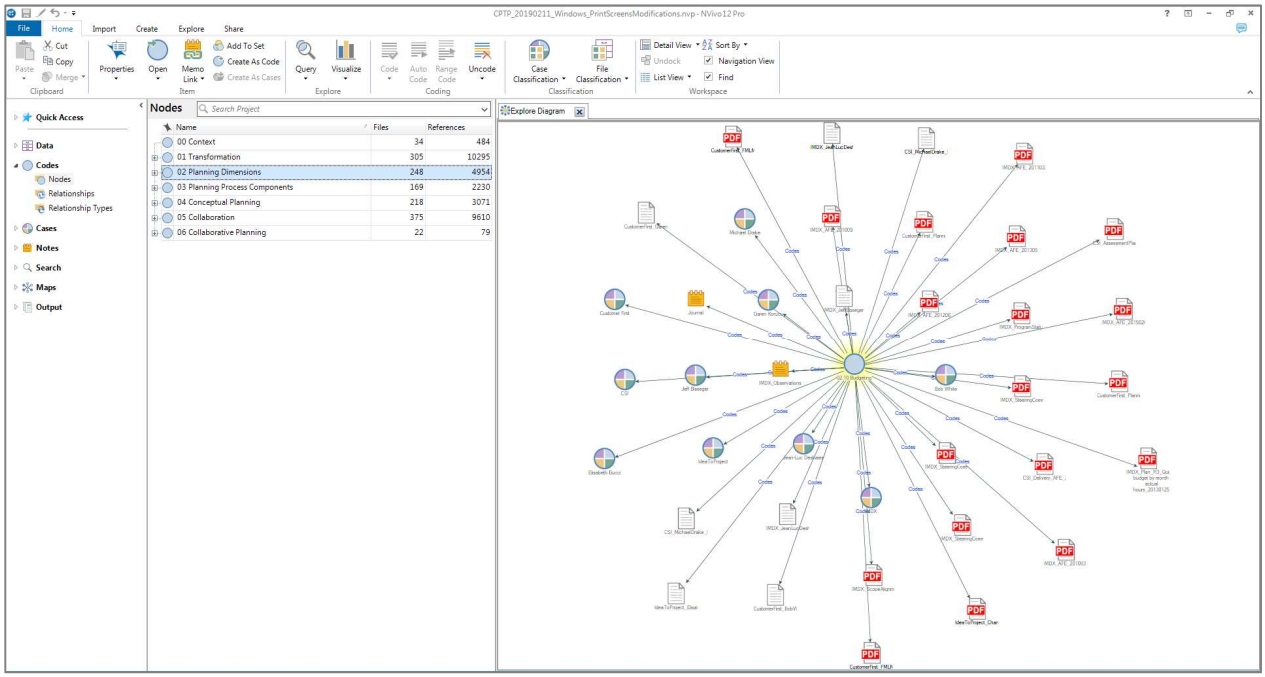

Figure B.3: Capture écran Nvivo 12 – Liens entre les sources de données

Dans ce qui suit une visualisation de la hiérarchie de nœuds par concentration et fréquence de codification.

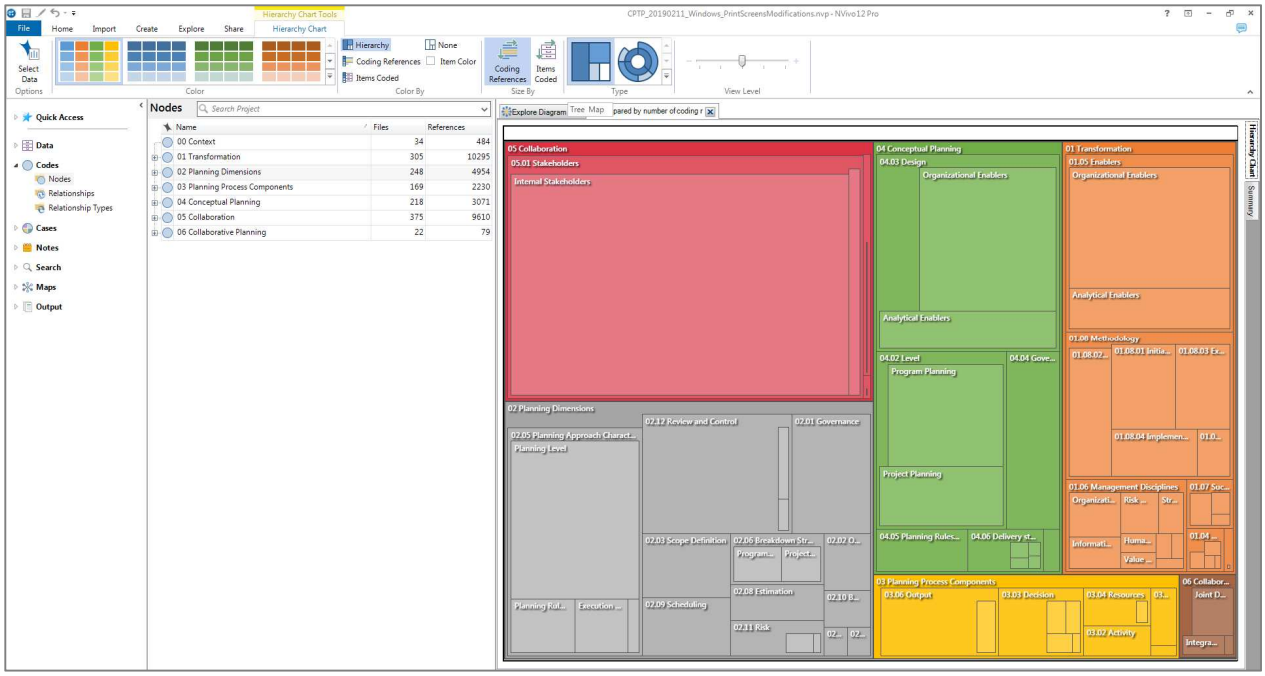

Figure B.4: Capture écran Nvivo 12 – Exemple d’analyse de fréquence de codification